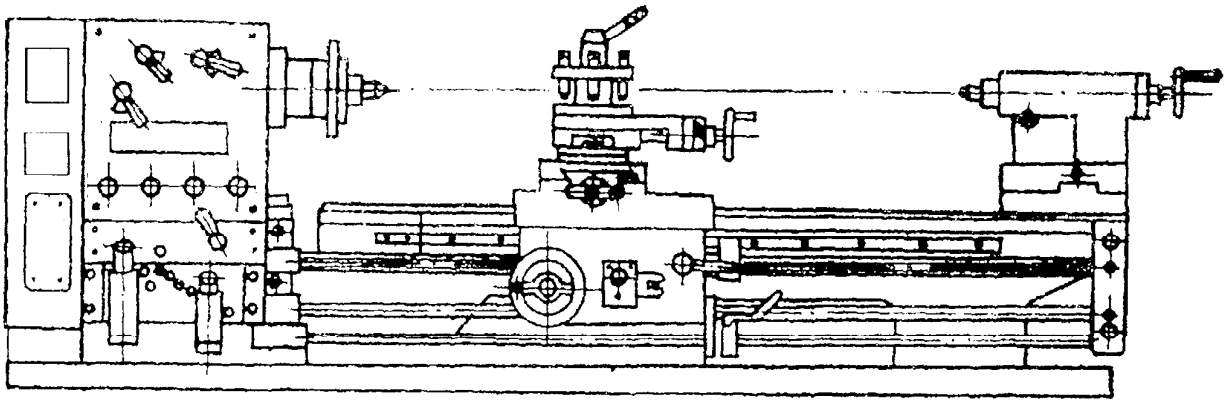
CENTRAL MACHINERY®

12" x 36" Metalworking Lathe

Model 33274

Assembly & Operating Instructions



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HARBOR FREIGHT TOOLS

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BENCH LATHE MODEL # 33274 SPECIFICATIONS

Motor:

Electrical:	220Volts, 60 Hz, Single Phase, 10 Amps.
Power Rating:	1-1/2 Horsepower
Speed:	1780 rpm, reversable
Drive:	Belt / Gear

Head Stock:

Overall:	12" Swing over Bed and 36" Center to Center
Spindle Gearing:	18 speeds, 50-1550 rpm
Spindle Bore:	1.496" (38mm) MT-5

Gear Box:

Variability:	18 Longitudinal feeds
Range of Feeds:	.004" - .031"
Thread Capability:	Metric: 29 settings from .2mm to 4.5mm
	SAE: 40 settings from 4 to 112 tpi.
Leadscrew:	7/8" diam x 8tpi
Thread Indicator:	Included

Compound and Carriage:

Toolpost Type:	4-way
Max. Tool Size:	1/2" x 1/2"
Tool Slide:	3" max. travel
Cross Slide:	6-1/4" max. travel with .001" scale
Saddle Travel:	30"
Saddle Feed:	.0011" to .0311" per revolution
Cross Feed:	.0003" to .0105" per revolution
Carriage:	16" max. travel
Swing over Gap:	19-7/8"
Width of Gap:	7-5/32"

Tailstock:

Tailstock Travel:	4"
Spindle Diameter:	1-1/4"
Taper:	MT-3

Additional Specifications:

Steady Rest:	Capacity 1/4" x 1-7/8"
Follow Rest:	Capacity 1/4" x 1-7/8"
Bed Dimensions:	54" L x 7-5/32" W
Overall Dimensions:	67"L x 28-3/4"W x 22-7/8"H
Shipping Weight:	1056 Lbs. (approx.)

SAVE THIS MANUAL

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

SAFETY WARNINGS

WARNING: When using this tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Do not force tool.** It will do the job better and more safely at the rate for which it was intended. Do not use inappropriate attachments in an attempt to exceed the tool capacity.
6. **Use the right tool for the job.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. Do not use a tool for a purpose for which it was not intended.
7. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
8. **Use eye and ear protection.** Always wear ANSI approved impact safety goggles at all times. Wear a full face shield if you are producing metal filings or wood chips. Wear an ANSI approved dust mask or respirator when working around metal, wood, and chemical dusts and mists.
9. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.
10. **Maintain tools with care.** Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and, if damaged, have them repaired by an authorized technician. The handles must be kept clean, dry, and free from oil and grease at all times.
11. **Disconnect power.** Unplug electrical equipment when not in use.
12. **Remove adjusting keys and wrenches.** Check that keys and adjusting wrenches are removed from the tool or machine work surface before plugging it in.
13. **Avoid unintentional starting.** Be sure the switch is in the Off position when not in use and before plugging in. Do not carry any tool with your finger on the trigger, whether it is plugged in or not.
14. **Stay alert.** Watch what you are doing, use common sense. Do not operate any tool when tired.

15. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts, any broken parts or mounting fixtures, and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn On and Off properly.

16. **Guard against electric shock.** Prevent body contact with grounded surfaces such as pipes, clamps, vises, and metal enclosures.

17. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Harbor Freight Tools.

18. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.

SPECIAL WARNINGS WHEN USING A LATHE

1. **Never operate this lathe with the Gear Cover open.** Moving belts and gears may cause injury, or become damaged.

2. **This lathe produces chips which may fly off at high speed.** Never operate this lathe without proper ANSI approved eye and face protection.

3. **Always use sharp tools, and never force the tool into the workpiece.** If a tool is forced, sudden breakage may occur, which can create dangerous flying debris.

4. **Always make sure that the tool is tight in the tool post,** and is adjusted so that the projection of the tool from the post is minimized. This will help prevent tool bending and possible breaking.

5. **Be sure that any tools or work pieces mounted in this lathe are balanced** before starting the lathe. Never run unbalanced pieces at high speed.

6. **Always check to be sure that all chuck keys, hex keys and other tools are removed** from the lathe and safely out of the way before starting the lathe.

7. **Keep your fingers away from moving parts of this lathe while in operation.**

NOTICE

The Warnings, Cautions, and Instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

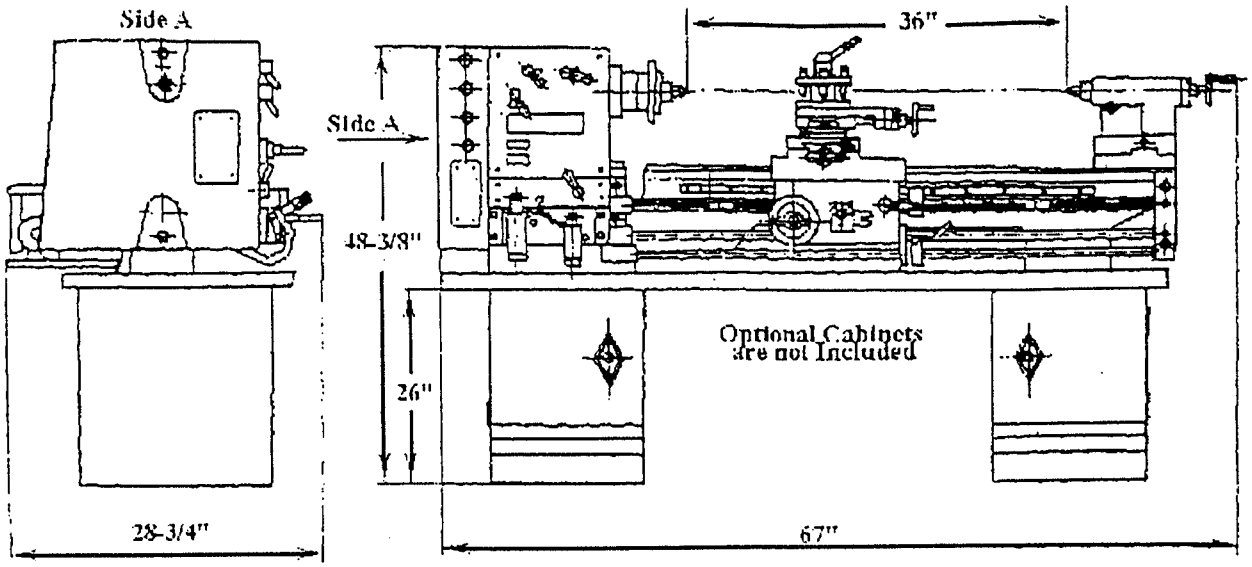


Figure 1. Overall Dimensions

SET UP AND PREPARATION FOR OPERATION

1. Indentify and prepare a location that will accept a machine of the size indicated above in Figure 1.
2. Make sure the location where the lathe is to be mounted is absolutely flat and level.
3. Prepare a work table which is flat and level, and which will support a minimum of 1500 Lbs. with a minimum of vibration.
4. If you will hoist the lathe with a single point hoist, observe the center of gravity, as shown below in Figure 2.
5. When installing the lathe, avoid twisting the bed.
6. After installation, check the lathe bed-way with a level for trueness both side to side and front to back. Adjust if not flat and level.

Leveling Procedure: Move the carriage to the headstock end of the bedway. Place the level in a 90 degree position on top of the crosslide. Loosen the mounting bolts and jack up the base stand (or bed) with adjusting washers to center the bubble in the level. Retighten the mounting bolts. Move the carriage to the tailstock end of the bed way and repeat the procedure. Recheck the tailstock end of the bedway, and repeat the procedure until both ends of the bedway are level. The longitudinal tolerance is .00002" and the cross tolerance is .00004".

7. The lathe must be bolted to the table top. If mounted on a stand, the stand must be bolted to the floor.

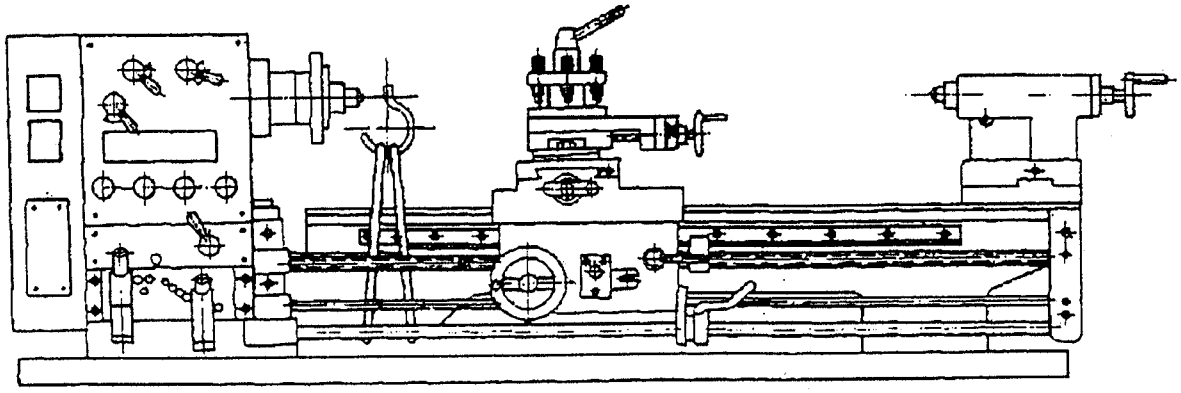


Figure 2. Center of Gravity for Hoist

OPTIONAL CHIP TRAY AND BACKSPLASH INSTALLATION

1. This lathe may be installed as is, or may have optional chip tray and / or backsplash added.
   Note: There are no chip tray or back splash included in this item.
   Contact Harbor Freight Tools for suitable chip tray and back splash for this lathe.
2. Place the chip tray on the surface, mark on the table top the location for the mounting bolts, by marking through the holes in the chip tray.
3. Remove the chip tray and drill the bolt holes.
4. Re align the chip tray with the bolt holes.
5. Place the lathe in position, aligning the mounting holes in the lathe base with the holes in the chip tray and the bench. Install the bolts, and tighten firmly.
6. Recheck that the installed lathe is level.
7. Assemble the Back Splash to the rear of the Lathe with the suitable bolts.

INITIAL CLEANING

1. Remove the rust protectant from all surfaces with a mild solvent.
2. Do not use any flammable solvents, such as gasoline, paint thinner or lacquer thinner, these will damage the painted surfaces.
3. After cleaning, wipe with a clean, dry cloth, and cover all machine surfaces with a light film of machine oil.

POWER SUPPLY

1. This lathe has been pre-wired for use with a 220 Volt, 60HZ, single phase power supply.
2. The correct wiring for the Motor power supply is shown on the wiring diagram mounted inside the motor terminal cover. *This diagram is reproduced below.*
3. ***We strongly recommend that you engage a professional, qualified electrician for any non-standard wiring required with this machine.***
   NOTE: This lathe is designed to run on 220 Volts. It is not designed to run on 110 Volts.

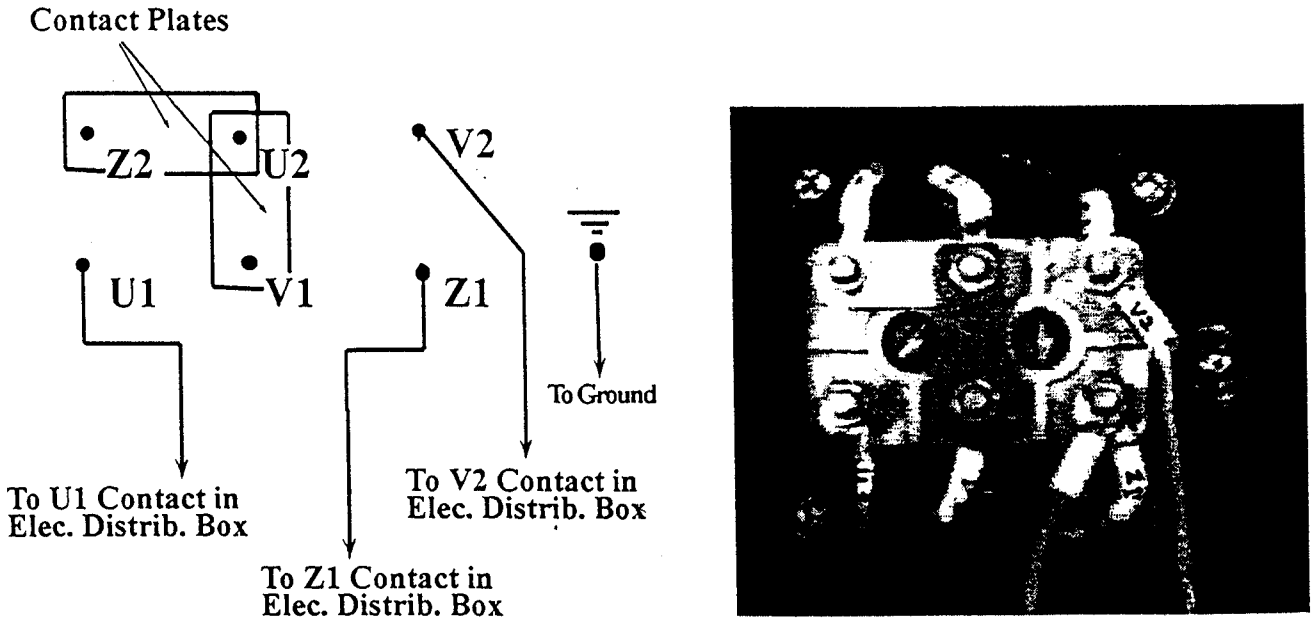
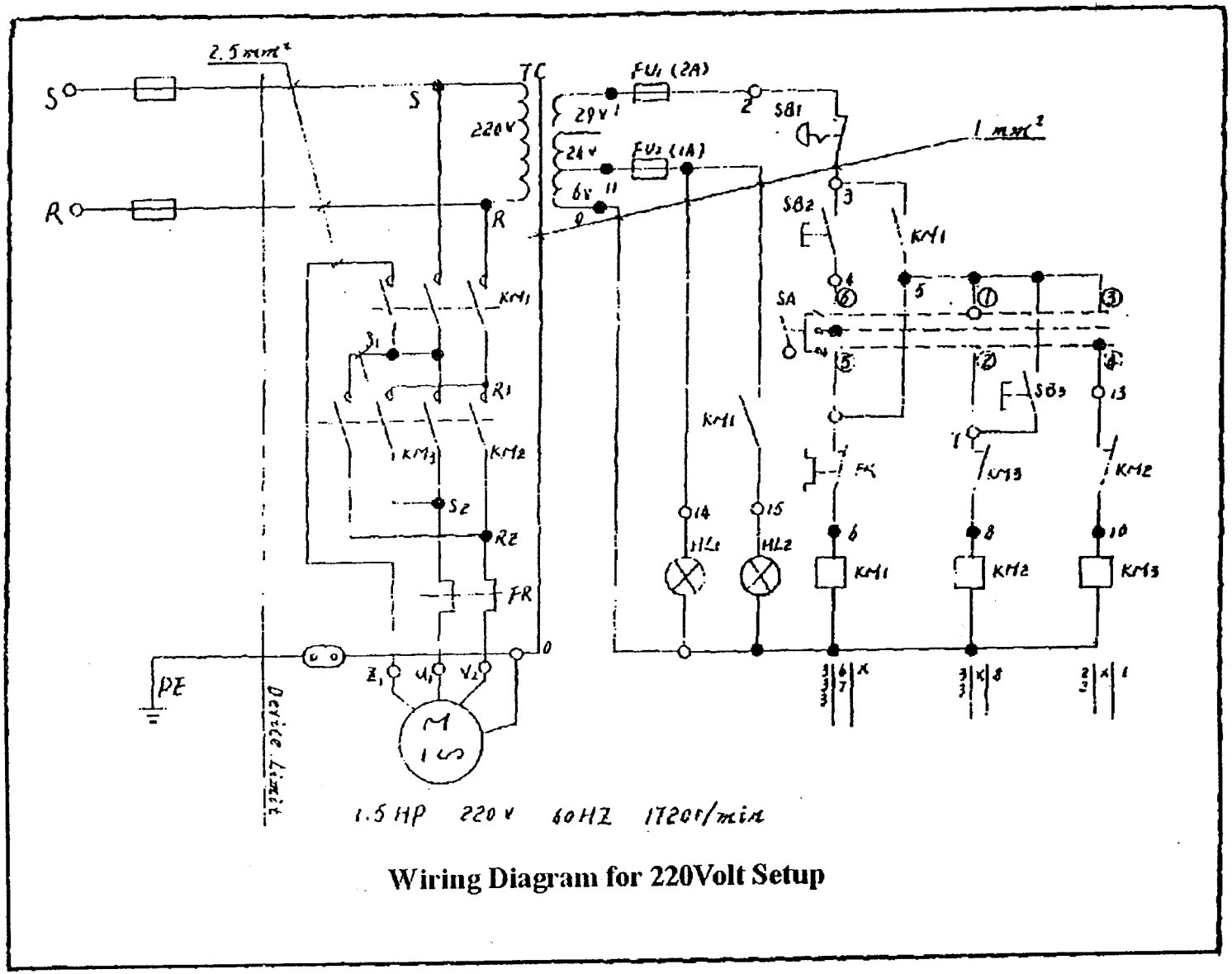


Figure 3. Correct Motor Wiring

Wiring Diagram Key

M	Induction Motor
KM1	AC Contactor
KM2	AC Contactor
KM3	AC Contactor
FR	Heating Relay
TC	Transformer
FU1	Fuse2Amp
FU2	Fuse 1Amp
SA	Selector Switch
SB1	Reset
SB2	Power Start
SB3	Inching
HL	Indicatror Lamp
PE	Ground



Wiring Diagram for 220Volt Setup

Wiring Diagram Key

M	Induction Motor
KM1	AC Contactor Relay
KM2	AC Contactor Relay
KM3	AC Contactor Relay
FR	Heating Relay
TC	Transformer
FU1	Fuse2Amp
FU2	Fuse 1Amp
SA	Selector Switch
SB1	Reset Switch
SB2	Power Start
SB3	Inching Switch
HL	Indicator Lamp
PE	Ground
XT	Contact Block
AMP	Breaker and Reset

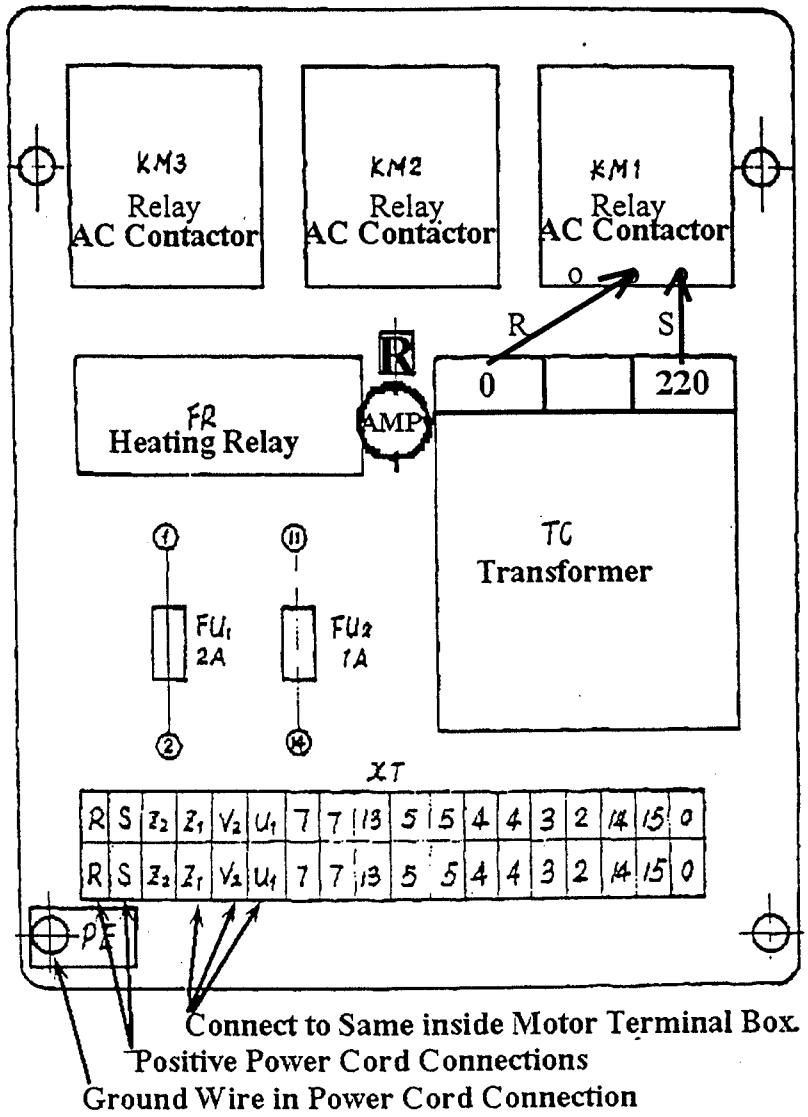


Figure 4. Wiring Distribution Plate

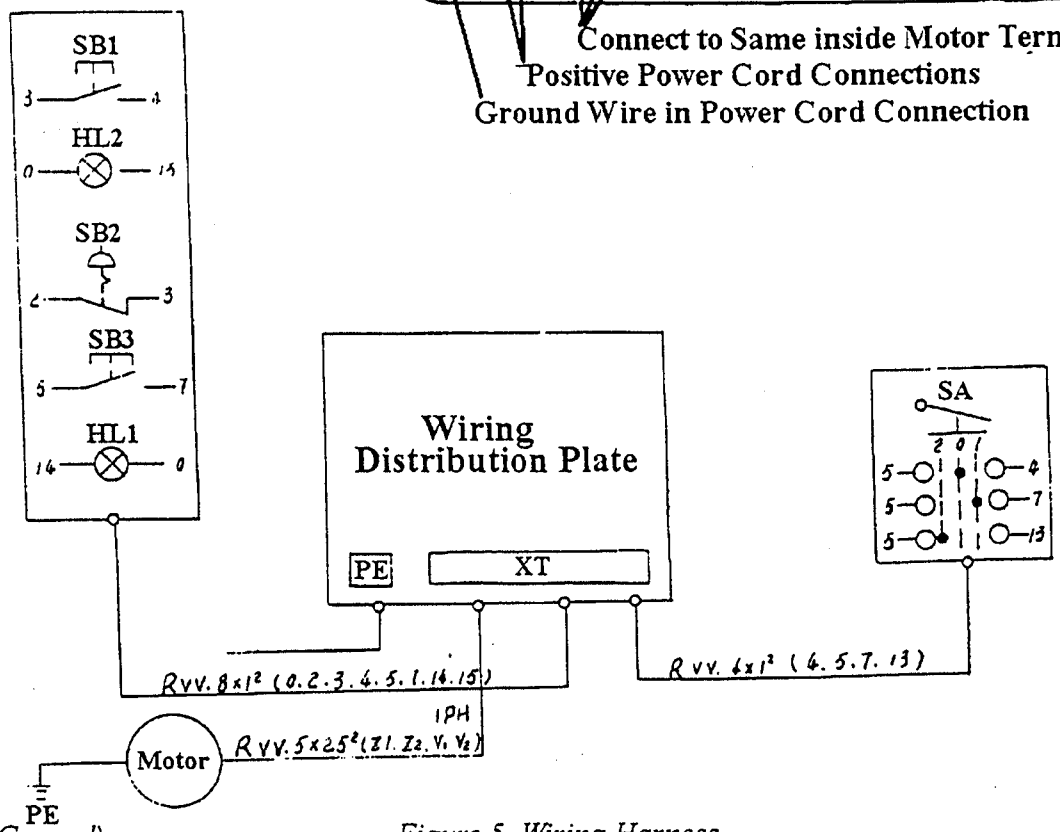


Figure 5. Wiring Harness

ELECTRICAL SAFETY CONSIDERATIONS

1. Before operating the machine, be sure that the motor specification and the wiring correspond to the power supply.
2. Also make sure that there is a 15 Amp breaker switch in the line.
3. The machine must he connected to ground or ground wire.
4. Avoid electrical hazard by routing the cord in a safe manner.
5. Never plug into a power source that does not meet the listed standards.
6. Never operate in a wet environment.

ELECTRICAL CONTROLS

Location of the main switches, motor and electrical distribution box are shown in the figure 4.

1. To set spindle rotation direction, operate the ***Selector Switch***. For **counter-clockwise** rotation, move the ***Selector Switch*** to the **forward** position. For **clockwise** rotation, move the ***Selector Switch*** to the **reverse** position.
2. Putting the ***Selector Switch*** into the **middle** position will **stop** the machine.
3. Pushing the ***Reset button*** will open the circuit and stop the machine.
4. The ***Power Start Switch*** will power the Motor, and start the Spindle turning if the ***Selector Switch*** is either forward or reverse.
5. The ***Inching Switch*** is used to rotate the Spindle only slightly in small increments.

Note: You can control the rotation direction of the spindle using the Selector Switch. You can also stop the rotation of the Spindle using the Selector Switch.

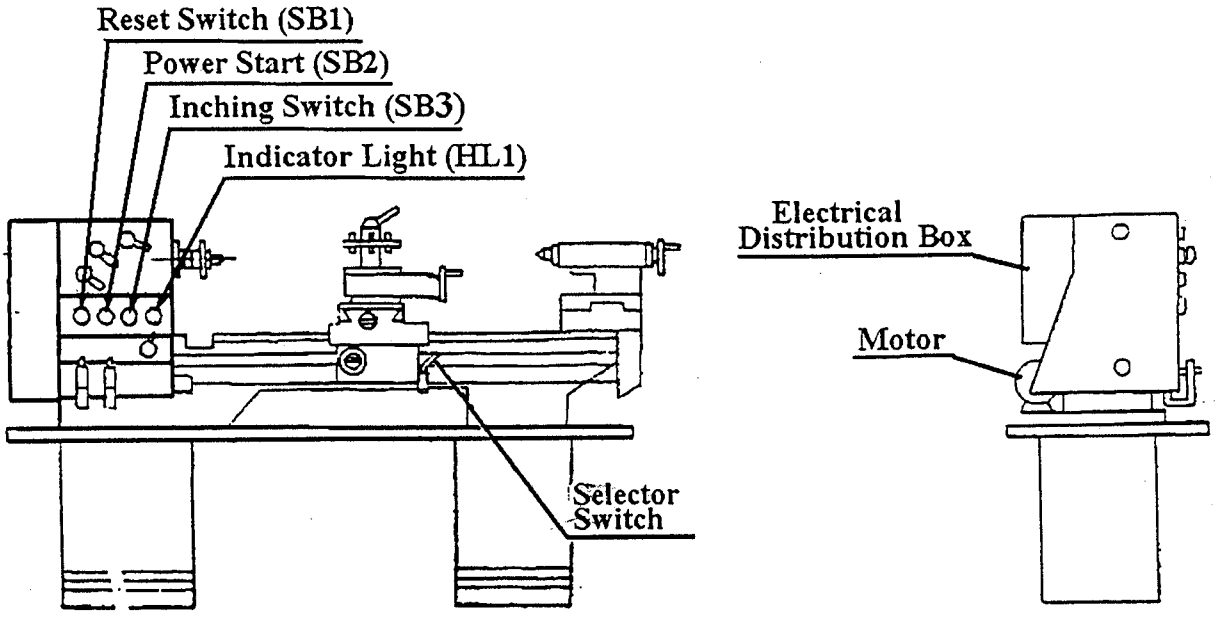


Figure 6. Electrical Controls and Equipment Locations

OPERATING INSTRUCTIONS

Initial Run-In

1. Before operating the machine, read this operating instruction and understand the required procedures for adjusting, operating, maintenance and lubrication, etc.
2. The machine is equipped with V-belts from the motor to the low rear pulley. It is advisable to check the tension before starting the machine. You should be able to depress the belt about 1/2 inch by normal finger pressure. Operating with an over-tight belt will ruin the bearing. Adjust the tension, if necessary.
3. For initial operation, set changing lever on the lowest speed and let the machine operate for 20 minutes. If it is functioning normally, increase the spindle speed step by step until the highest speed is tested. Let each speed operate for approximately 5 minutes to assure it is functioning smoothly.

Caution: Never attempt to change the speed unless the motor is completely stopped.

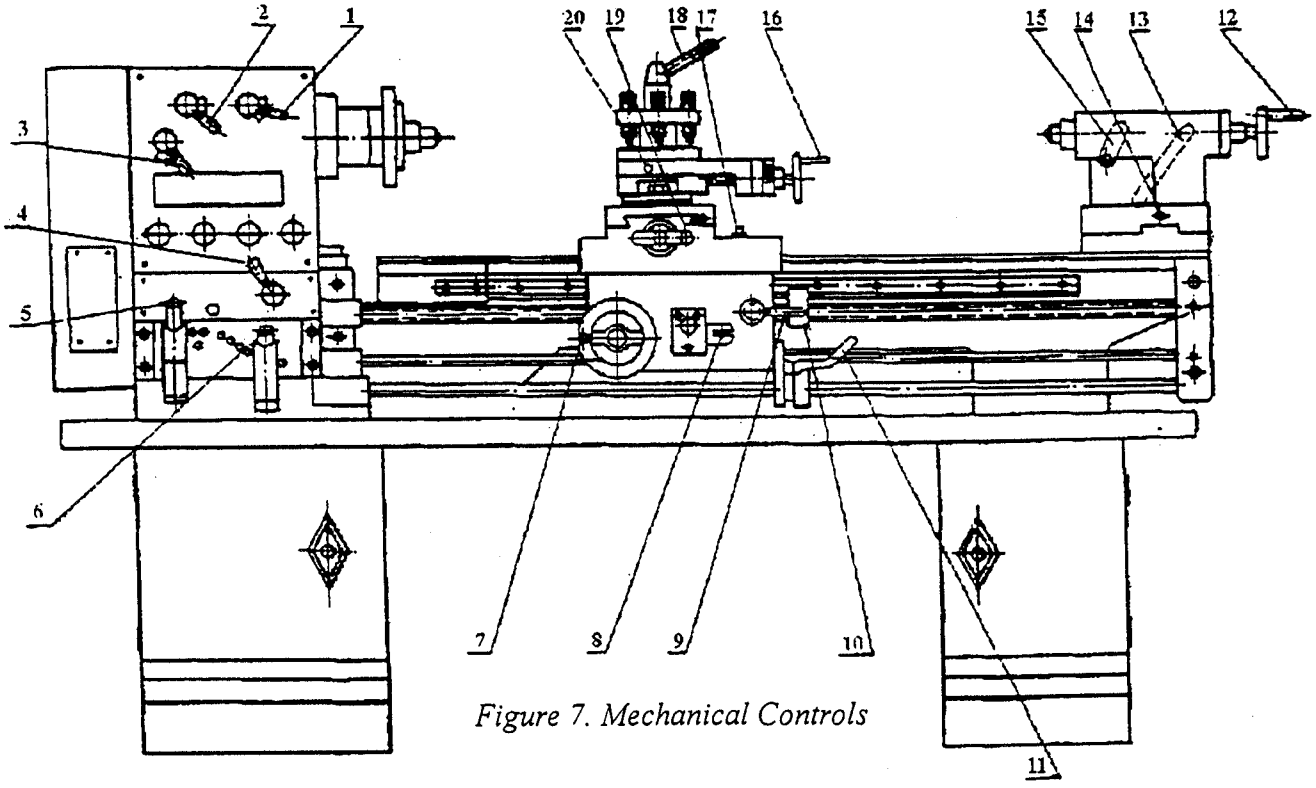


Figure 7. Mechanical Controls

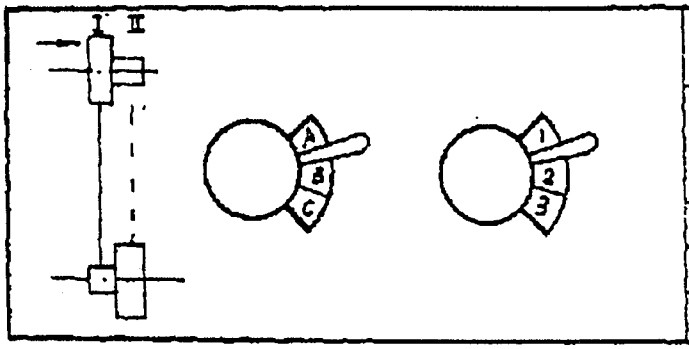
MECHANICAL CONTROLS

1	Gear Lever 1 (Numeric scale)	11	Selector Switch
2	Gear Lever 2 (Alphabetic scale)	12	Tailstock Handwheel
3	Lead / Feed Lever	13	Tailstock Clamp Lever
4	Thread or Feed Selecting Lever	14	Tailstock Offset Set Screws
5	Feed Gear Lever 1 (5-position)	15	Quill Lock Lever
6	Feed Gear Lever 2 (8-position)	16	Compound Slide Crank
7	Carriage Handwheel	17	Saddle Lock Screw
8	Feed Lever	18	Clamp Lever
9	Thread Lever	19	Cross Feed Crank
10	Thread Cutting Dial	20	Compound Slide Screw

HEADSTOCK

Please refer to Figures 7 and 8.

1. Using various settings of levers (#1) and (#2), and the V-belts the headstock can provide 18 step speeds from 50 to 1550 r.p.m. as shown in "spindle speed chart" located on the front side of headstock and reproduced below.
2. For example, to produce a spindle speed of 1550 rpm, place the V-belt as shown in position I, place Gear Lever 1 in position 2, and place Gear Lever 2 in position A.



Spindle Speed Chart

60	I			II		
Hz	1	2	3	1	2	3
A	320	1550	950	220	1150	700
B	90	430	260	60	300	200
C	240	1200	725	180	890	525

Figure 8. Spindle Speed Chart

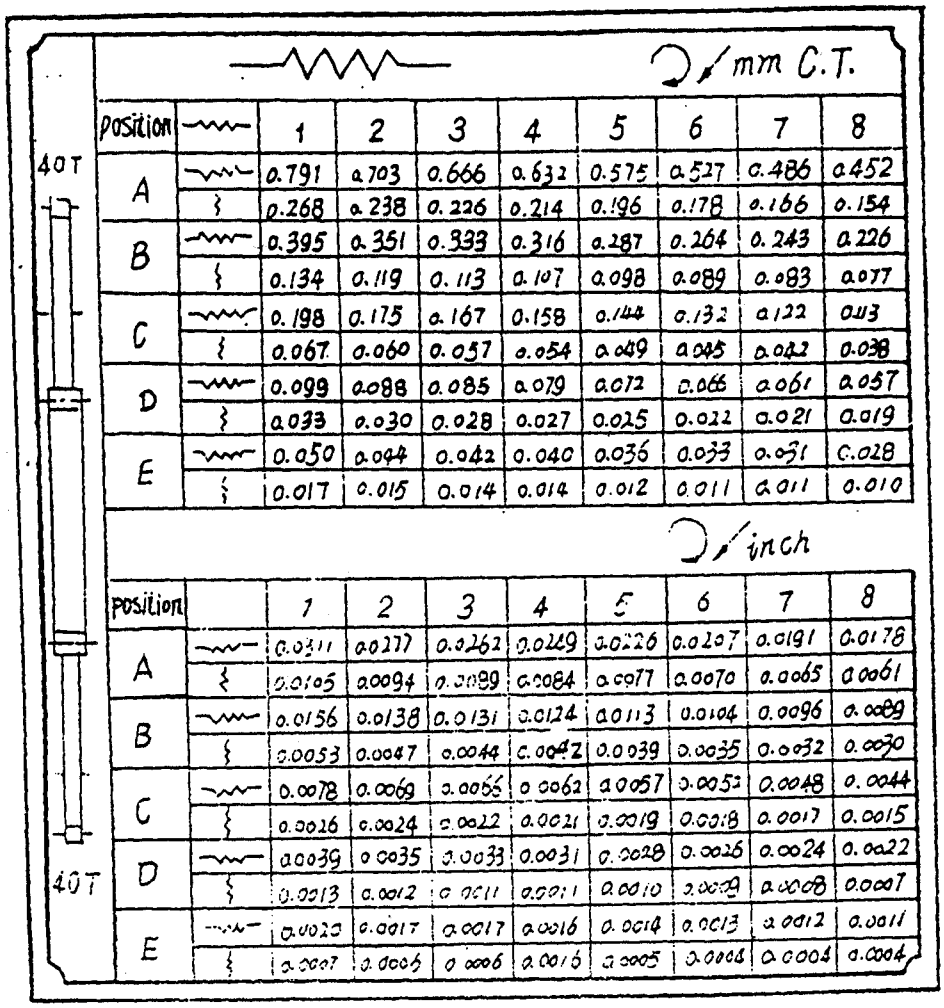
3. To start or stop the spindle use the SELECTOR SWITCH (#11) Moving the SELECTOR SWITCH (#11) up and the spindle will rotate counter-clockwise; move the SELECTOR SWITCH (#11) down and the the spindle will rotate clockwise. With the Lever in the middle position, the spindle will not rotate.

QUICK CHANGE GEAR BOX

Please refer to Figure 7.

1. Use LEVER (#4) to select threading or feeding. Position the LEAD / FEED LEVER (#3) to the Left for feeding. Center position is neutral. Right position is for lead screw.
2. LEVERS (#5) & (#6), control the feed gear box. LEVER (#5) has five positions which are identified Alphabetically. LEVER (#6) has eight positions which are identified Numerically.
3. Different settings of the two levers can provide various feed rates. The Feed Rate Chart is mounted on the left side of the Headstock.
   This chart is reproduced on the next page as Figure 11.
4. LEVERS (#5) & (#6) are also used to control the feed rate for various thread pitches. Both an SAE and a Metric Thread Pitch chart are mounted on the front of the Headstock.
   These charts are reproduced on the next pages as Figures 12 and 13.

Caution. Always stop the spindle before engaging any of above 3 levers.



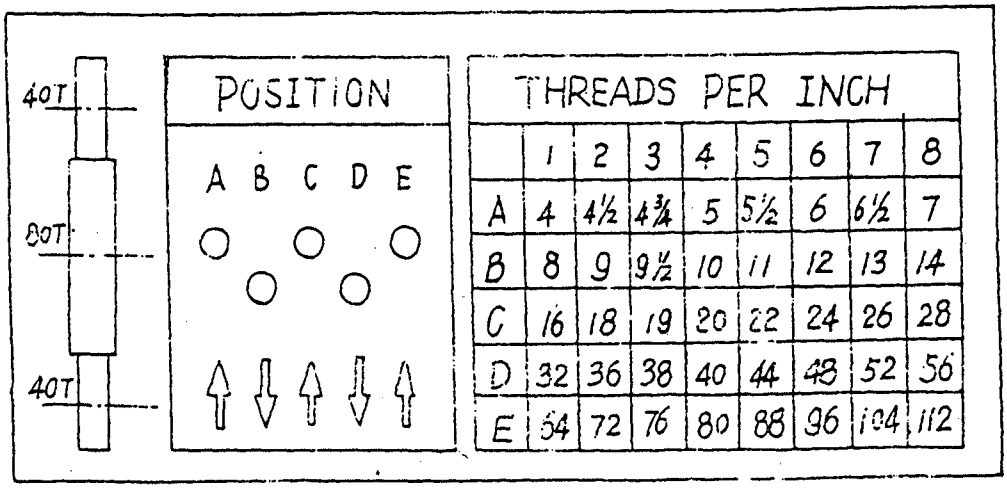
mm C.T.

position		1	2	3	4	5	6	7	8
A	~	0.791	0.703	0.666	0.632	0.575	0.527	0.486	0.452
	≀	0.268	0.238	0.226	0.214	0.196	0.178	0.166	0.154
B	~	0.395	0.351	0.333	0.316	0.287	0.264	0.243	0.226
	≀	0.134	0.119	0.113	0.107	0.098	0.089	0.083	0.077
C	~	0.198	0.175	0.167	0.158	0.144	0.132	0.122	0.113
	≀	0.067	0.060	0.057	0.054	0.049	0.045	0.042	0.038
D	~	0.099	0.088	0.085	0.079	0.072	0.066	0.061	0.057
	≀	0.033	0.030	0.028	0.027	0.025	0.022	0.021	0.019
E	~	0.050	0.044	0.042	0.040	0.036	0.033	0.031	0.028
	≀	0.017	0.015	0.014	0.014	0.012	0.011	0.011	0.010

inch

position		1	2	3	4	5	6	7	8
A	~	0.0311	0.0277	0.0262	0.0249	0.0226	0.0207	0.0191	0.0178
	≀	0.0105	0.0094	0.0089	0.0084	0.0077	0.0070	0.0065	0.0061
B	~	0.0156	0.0138	0.0131	0.0124	0.0113	0.0104	0.0096	0.0089
	≀	0.0053	0.0047	0.0044	0.0042	0.0039	0.0035	0.0032	0.0030
C	~	0.0078	0.0069	0.0066	0.0062	0.0057	0.0052	0.0048	0.0044
	≀	0.0026	0.0024	0.0022	0.0021	0.0019	0.0018	0.0017	0.0015
D	~	0.0039	0.0035	0.0033	0.0031	0.0028	0.0026	0.0024	0.0022
	≀	0.0013	0.0012	0.0011	0.0011	0.0010	0.0009	0.0008	0.0007
E	~	0.0020	0.0017	0.0017	0.0016	0.0014	0.0013	0.0012	0.0011
	≀	0.0007	0.0006	0.0006	0.0006	0.0005	0.0005	0.0004	0.0004

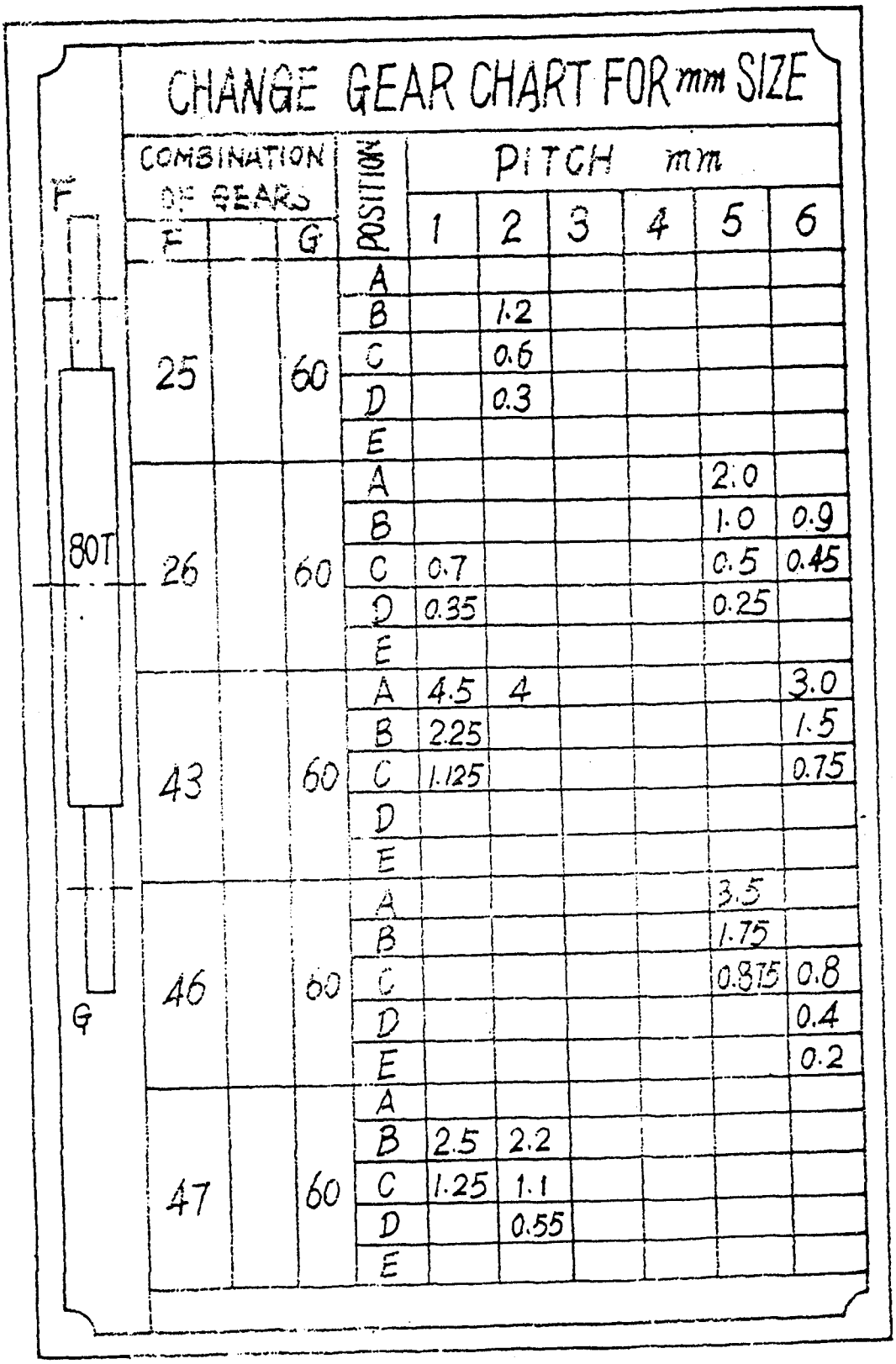
Figure 9. Feed Rate Chart



THREADS PER INCH

	1	2	3	4	5	6	7	8
A	4	4½	4¾	5	5½	6	6½	7
B	8	9	9½	10	11	12	13	14
C	16	18	19	20	22	24	26	28
D	32	36	38	40	44	48	52	56
E	64	72	76	80	88	96	104	112

Figure 10. SAE Thread Pitch Chart



CHANGE GEAR CHART FOR mm SIZE

COMBINATION OF GEARS F		G	POSITION	PITCH mm 1	2	3	4	5	6
25		60	A						
			B		1.2				
			C		0.6				
			D		0.3				
			E						
26		60	A					2.0	
			B					1.0	0.9
			C	0.7				0.5	0.45
			D	0.35				0.25	
			E						
43		60	A	4.5	4				3.0
			B	2.25					1.5
			C	1.125					0.75
			D						
			E						
46		60	A					3.5	
			B					1.75	
			C					0.875	0.8
			D						0.4
			E						0.2
47		60	A						
			B	2.5	2.2				
			C	1.25	1.1				
			D		0.55				
			E						

Figure 11.MetricThread Pitch Chart

CARRIAGE ASSEMBLY

Please refer to Figure 7.

1. The CARRIAGE HANDWHEEL (#7) is used for manually moving the carriage along the bedway.
2. The CROSS FEED CRANK (#19) is used to manually move the cross slide in or out.
3. The COMPOUND SLIDE CRANK (#16) is used to manually move the tool post.
4. The COMPOUND SLIDE is fully adjustable to any angle and is also used for threading or machining an angle on the workpiece.
5. The SELECTOR SWITCH (#11) is used to control the spindle rotation direction, either clockwise or counterclockwise.
6. The THREAD LEVER (#9) is used to engage the half nuts when threading.
7. The FEED LEVER (#8) is used to engage either the longitudinal or cross feed. This lever has a safety interlock to prevent accidental engagement of the half nuts when the lathe is in feed mode.
   The Feed Lever has three positions: Center position is disengaged. Upper position engages the power longitiudinal feed. Lower position engages the power cross feed.
8. The LEAD / FEED LEVER (#3) is used to change the direction of either longitudinal or cross feed while remaining in the same spindle rotation.
9. The THREAD CUTTING DIAL (#10) is used to engage the half nuts with the lead screw in the same thread that has been previously cut.
   Please note. Use any line of the dial for even thread pitches; but you must use the same starting line for odd thread pitches. i.e. When cutting a shaft with 10 tpi, engage the half nuts at any number on the thread dial. When cutting an odd pitch, such as 9 tpi, if you start the cut using a 1 or a 3, continue to use the 1 or the 3 until the thread is finished.
10. The CLAMP LEVER (#18) is used to secure the Tool Post in position while cutting.
11. Loosening the CLAMP LEVER (#18), the Tool Post can rotate counterclockwise to change cutting tools.
12. The SADDLE LOCK SCREW (#17) is used to firmly clamp the Saddle to the Bedway.
13. The COMPOUND SLIDE SCREW (#20) is used to clamp the Compound Slide to the Saddle.

TAILSTOCK

Please refer to Figure 7.

1. The TAILSTOCK HANDWHEEL (#12) is used to feed or retract the Quill. Turning the Handwheel counterclockwise until a full stop is reached will automatically eject the tool being used.
2. The TAILSTOCK CLAMP LEVER (#13) locks the Tailstock to the Bedway. To lock, put the lever up. To release, put it down.
3. The QUILL LOCK LEVER (#15) prevents the Quill from moving. Before operating the TAILSTOCK HANDWHEEL (#12), release the lever. Feed the Quill to desired position, then lock the Lever.
4. Two SET SCREWS (#14) on either side of the base are used to offset the Tailstock. After the taper adjustment is made, retighten both screws.

Note: The clearance of cross feed nuts on the saddle may be adjusted as follows: Loosen the 2-m6 screws (#2), then rotate the center screw (#1) downward until slight drag is felt when moving the slide. Then re-tighten the 2 m6 screws.

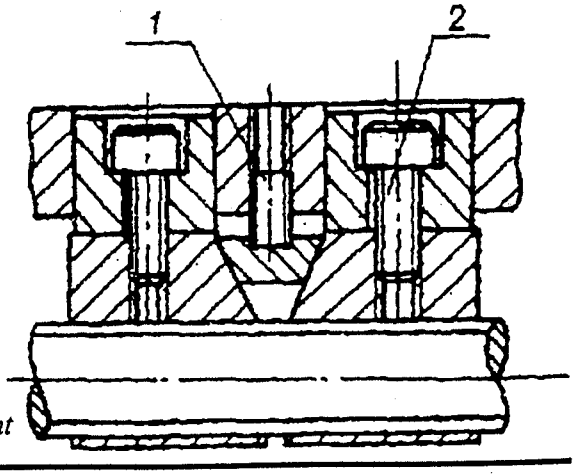


Figure 12. Tailstock Slide Adjustment

MOUNTING AND DETACHING THE FACE PLATE

1. The Chuck or Face Plate are mounted onto the Spindle using a Type D cam-locking mechanism.
2. When mounting, put the three pull pins of the Face Plate or Chuck into the three holes in the Spindle Face End.
3. Then turn the three cams clockwise using a square head wrench. This will tighten the Chuck or Face Plate.
4. To remove, turn the cams counterclockwise until they release.

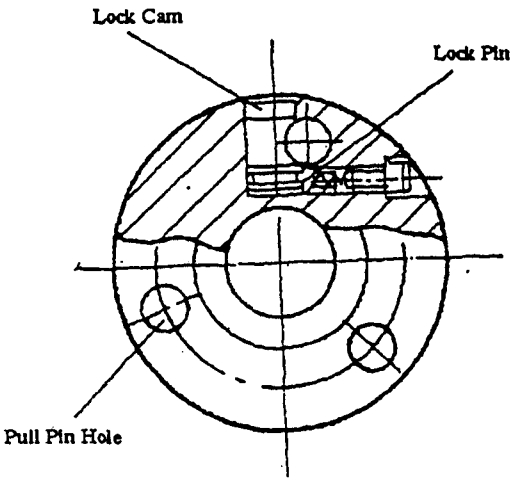


Figure 13. Face Plate Cam Assembly

LUBRICATION

1. Before operating this Lathe, check the oil level and lubricate all sliding and rotating parts, as shown in the lubrication chart below.
2. Usa Mobil DTE Light or equivalent oil for Headstock and Feedbox. Use Mobil Vactra or equivalent for other lubrication..

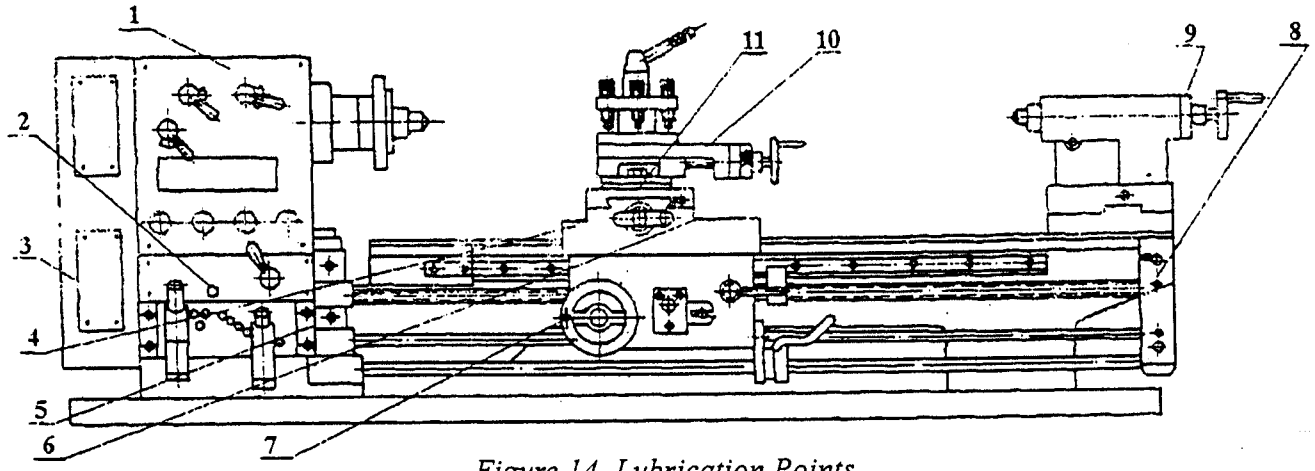


Figure 14. Lubrication Points

3. *Please refer to Figure 16 for Lubrication Points.*
4. Headstock Lubrication Port (#1). Open this port and fill with oil until the level at the sight port is 2/3 full. After running for the first 90 days, drain and replace this oil. Thereafter, drain and replace once each year.
5. Lubrication points #2 through #11 should be oiled each 4 hours of run time.
6. Point #2 is for the Gear Box, Point #3 for Change Gear. Point #4 is for the Apron. #5 is for the Gear Box. Point #6 is for the Carriage Slide. #7 is for the Handwheel. #8 (2 points) is for the Collar of the Bracket. #9 is for the Tailstock, #10 for the Tool Post Slide, and #11 is for the Saddle Screw.
7. Also lubricate before use the following areas: Dovetail Slot, Half Nut, Worm Gear, Lead Screw, Feed Rod, Handle Rod, and Tailstock Quill.

MAINTENANCE

1. Before operating the machine, check the oil level and lubricate all sliding and rotating parts according to the Lubrication Chart (Fig. 16).
2. During use, continually clean every sliding surface to remove chips. Sliding and threaded components can be damaged by chips lodging within their moving parts.
3. Frequently check the felt element on each end of the saddle, and if damaged, wash or change it.
4. After operating the lathe, clean all parts of the machine and oil each slide surface, leadscrew, feed rod etc. to avoid rusting.
5. Periodically wash the headstock, gear box, apron and change the oil.
6. Keep oil from getting onto the motor and V-belt.
7. Periodically check and adjust the V-belt.
8. Don't change the gear levers while the spindle is running to prevent damaging the gears.
9. If you are unable to change the gears, you can free them by turning the spindle by hand.
10. When using a steady rest or follower rest, frequently oil the contact points between the slidepieces and workpiece.
11. Protect the spindle nose, short taper, and taper bore of the spindle from damage, to prevent reduced working accuracy.
12. If you discover any significant wear or damage, repair it immediately.

REPLACING EASILY DAMAGED PARTS

The Cross Feed Nuts and Half Nuts are made of a self-lubricating alloy, which is softer than steel, and is subject to being damaged by chips of a harder material. You may wish to manufacture replacement nuts on your lathe to have them on hand when needed. Here are specification drawings for your use.

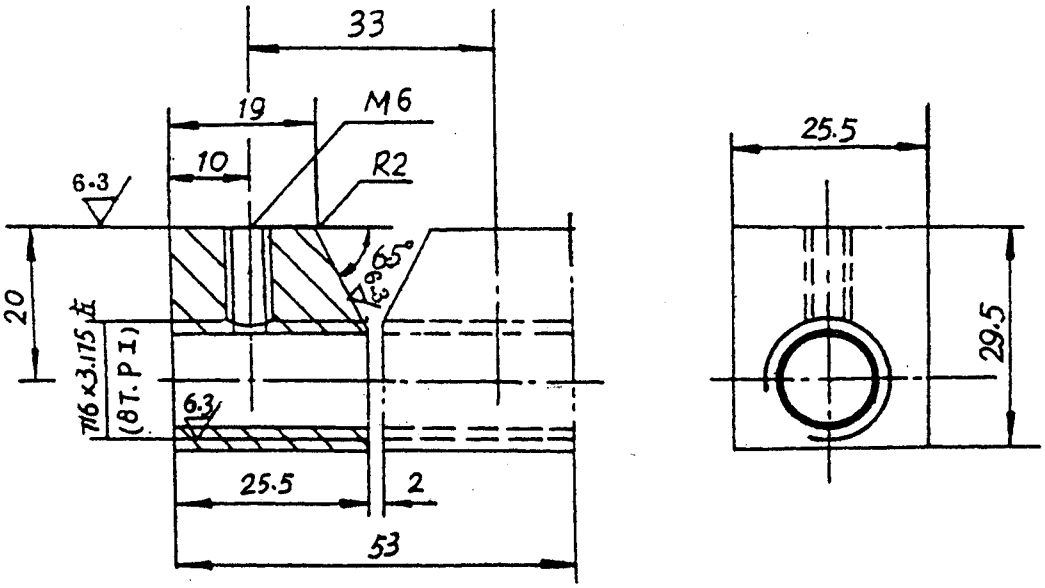


Figure 15. Cross Feed Nuts Drawing (2 Required).

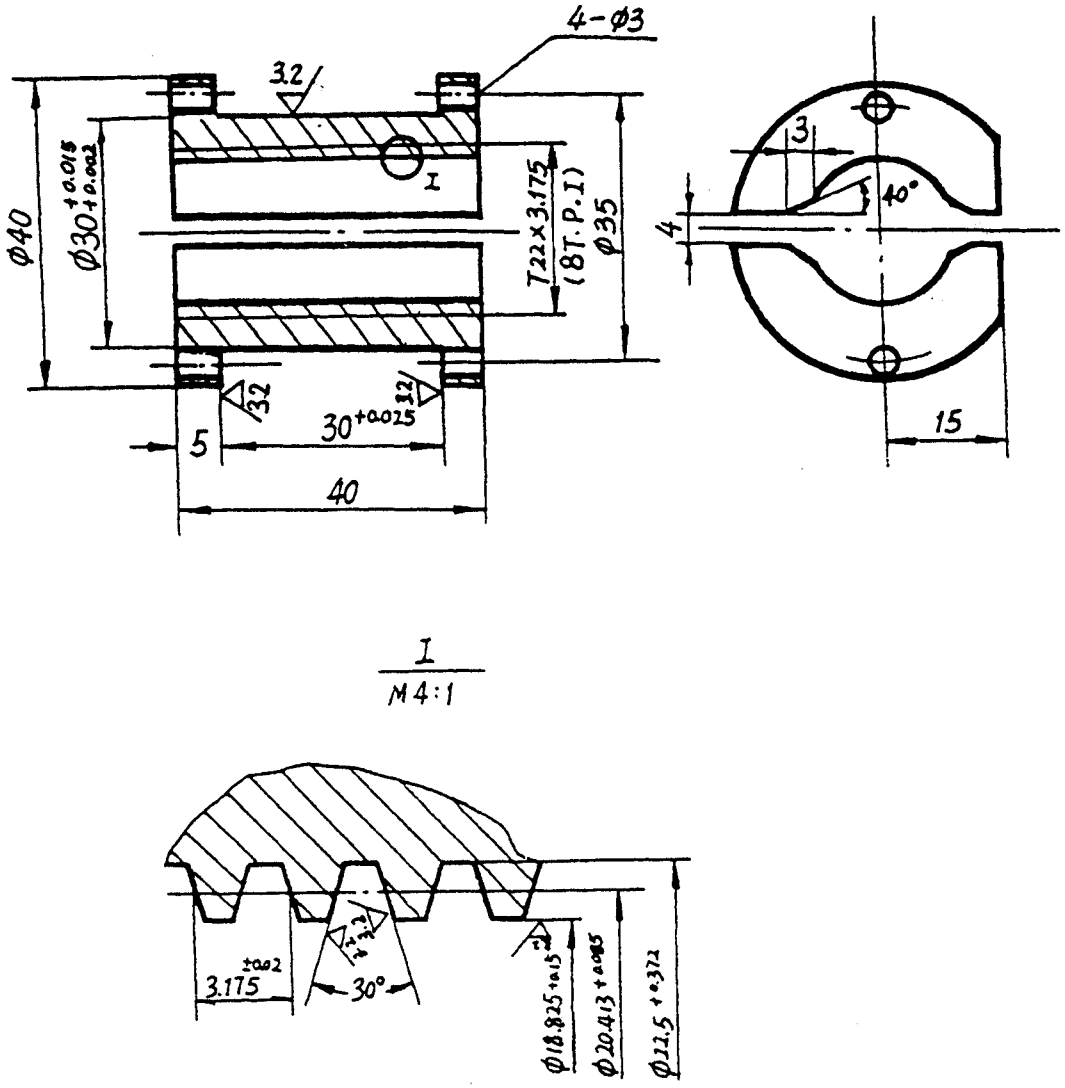
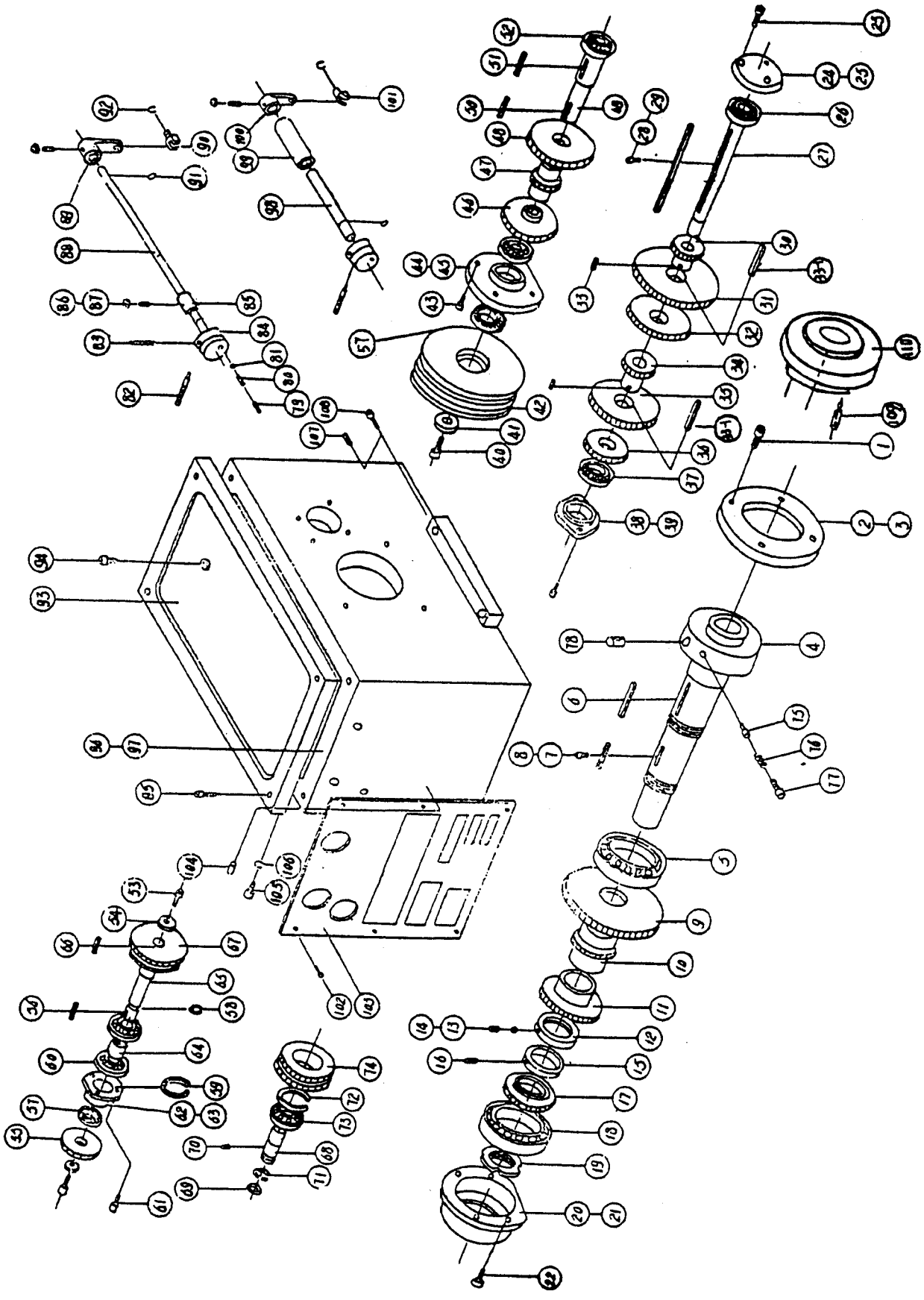


Figure 16. Half Nut Drawing (1 Required).

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

HEADSTOCK PARTS DIAGRAM



Please refer to parts list on pages 19 and 20 for this diagram.

HEADSTOCK PARTS LIST, PAGE 1

When ordering parts from this list, please mention "Headstock Part Number", as well as the number.

No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation	No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation
1	Screw	4		M8×25	36	Gear	1	1019	
2	Cover	1	1037		37	Bearing	1		60104
3	Oil Seal	1		δ=0.5mm	38	Oil Seal	1		δ=0.5mm
4	Spindle	1	1036		39	Cover	1	1007	
5	Bearing	1		7212	40	Screw	1		M8×20
6	Key	1		8×82	41	Washer	1	1009	
7	Key	1		8×45	42	Pulley	1	1012	
8	Screw	2		M3×8	43	Screw	4		M6×12
9	Gear	1	1030		44	Cover	1	1010	
10	Gear	1	1029		45	Oil Seal	1		δ=0.5mm
11	Gear	1	1028		46	Gear	1	1011	
12	Nut	1	1022		47	Gear	1	1016	
13	Washer	2	1023		48	Gear	1	1017	
14	Screw	2		M8×8	49	Shaft	1	1008	
15	Collar	1	1021		50	Key	1		5×30
16	Screw	1		M8×8	51	Key	1		5×80
17	Gear	1	1006		52	Bearing	1		104
18	Bearing	1		7211	53	Screw	2		M6×12
19	Nut	2	1005		54	Washer	2	1024	
20	Oil Seal	1		δ=0.5mm	55	Gear	2	1002	
21	Cover	1	1004		56	Key	1		5×8
22	Screw	4		M8×16	57	Oil Seal	1		PD20×45
23	Screw	5		M6×16			2		×10
24	Cover	1	1039		58	Circlip			20
25	Oil Seal	1		δ=0.5mm	59	Circlip	1		42
26	Bearing	1		60304	60	Bearing	1		104
27	Shaft	1	1038		61	Screw	2		M6×16
28	Key	1		8×180	62	Oil Seal	3		δ=0.5mm
29	Screw	2		M3×8	63	Cover	1	1003	
30	Gear	1	1015		64	Collar	1	1027	
31	Gear	1	1013		65	Shaft	1	1026	
32	Gear	1	1014		66	Key	1		5×20
33	Screw	4		M5×6	67	Gear	1	1025	
33-1	Key	2		5×20	68	Shaft	1	1001	
34	Gear	1	1020		69	Oil Seal	1		22×2.4
35	Gear	1	1018		70	Screw	1		M8×6

Please refer to parts diagram on page 18 for this list.

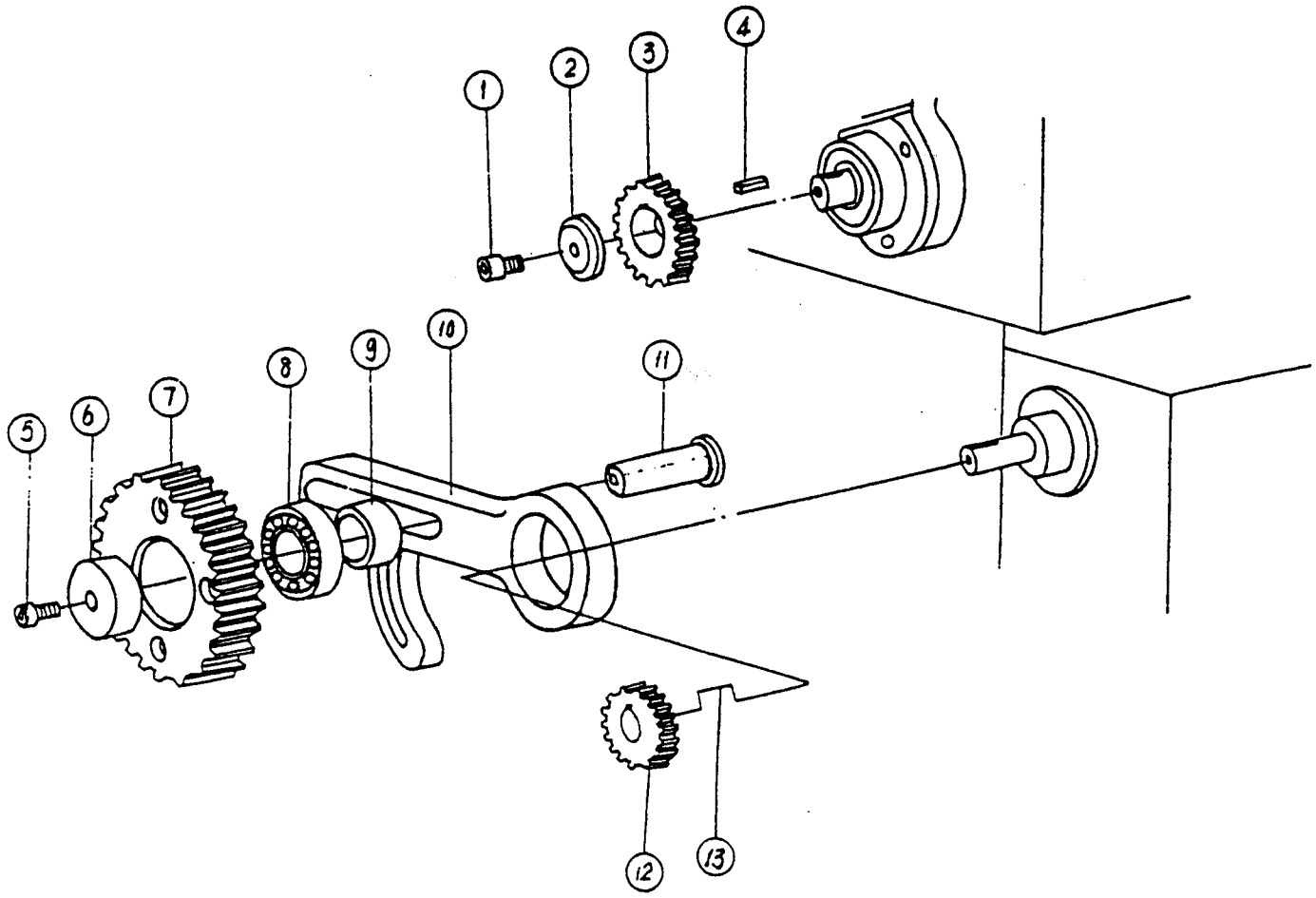
HEADSTOCK PARTS LIST, PAGE 2

When ordering parts from this list, please mention "Headstock Part Number", as well as the number.

No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation	No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation
71	Circlip	1		20	93	Cover	1	1042	
72	Circlip	2		47	94	Screw	1	1043	
73	Bearing	1		204	95	Screw	6		M6×25
74	Gear	1	1031		96	Oil Seal	1		δ =0.5mm
75	Lock Pin	3	1033		97	Headstock	1	1032	
76	Spring	3	1034		98	Shaft	1	1049	
77	Screw	3		M8×16	99	Collar	1	1050	
78	Eccentric Shaft	3	1035		100	Shifter Arm	1	1051	
79	Screw	6		M8×8	101	Shifter	1	1052	
80	Spring	6	1048		102	Rivet	6		2×6
81	Ball	6		Φ6	103	Signboard	1	1054	
82	Handle	3	1046		104	Oil Window	1		12A
83	Pin	3		5×40	105	Screw	1	1053	
84	Boss	3	1047		106	Oil Seal	1		14×2.4
85	Collar	1	1045		107	Screw	2		M8×30
86	Nut	6		M8	108	Screw	2		M8×35
87	Screw	6		M8×12	109	Rod	9	F3004	
88	Shaft	2	1044		110-1	Face Plate	1	F3001	
89	Shifter Arm	2	1041		110-2	Flange For 3-jaw Chuck	1	F3002	
90	Shifter	2	1040		110-3	Flange For 4-jaw Chuck	1	F3003	
91	Oil Seal	5		16×2.4					
92	Circlip	3		12					

Please refer to diagram on page 18 for this list.

CHANGE GEAR PARTS LIST

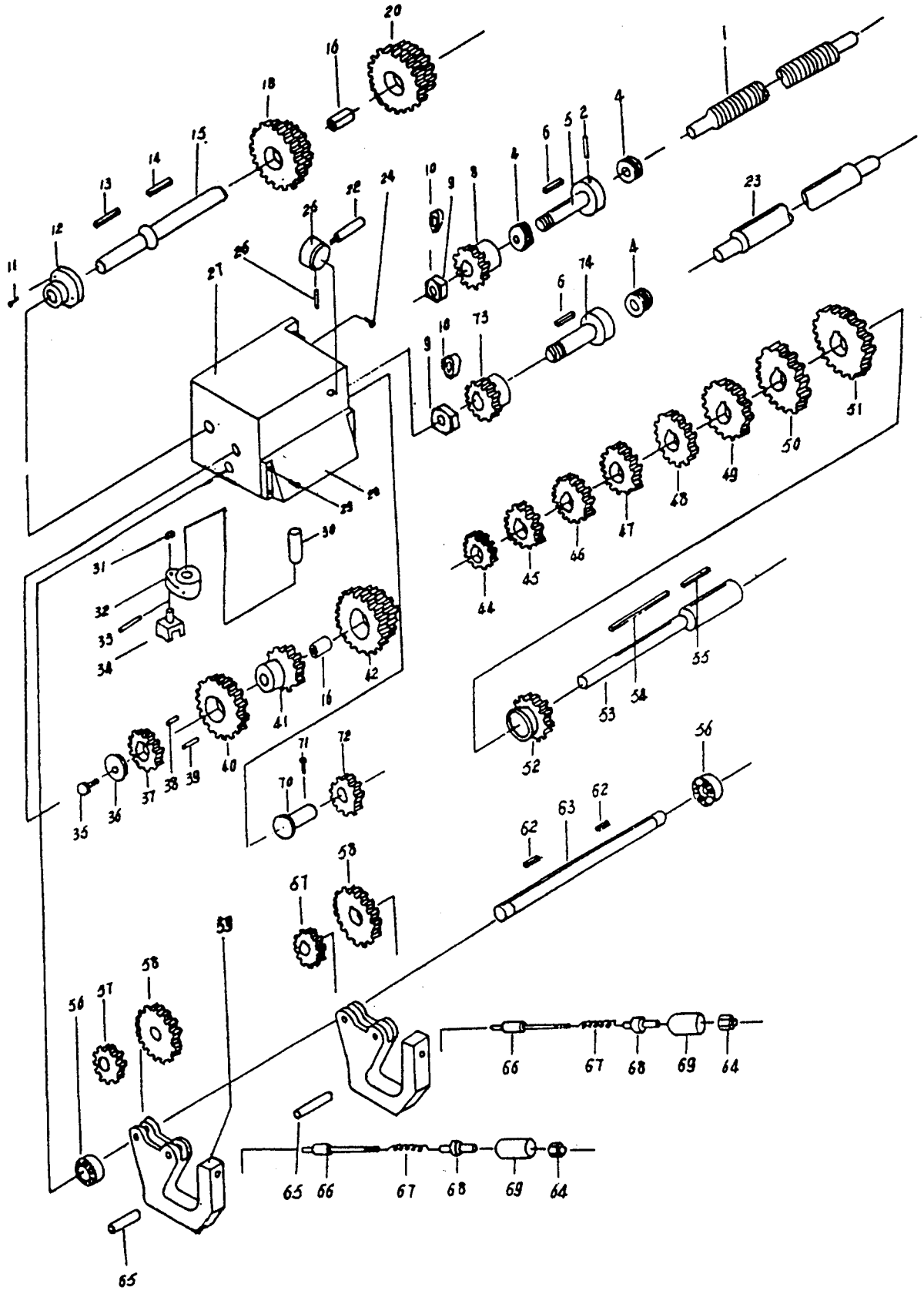


When ordering parts from this list, please mention "Change Gear Part Number", as well as the number.

No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Screw	1		M6 × 12
2	Washer	1	2007	
3	Gear	1	1002	
4	Key	1		5 × 8
5	Screw	1		M6 × 12
6	Washer	1	2004	
7	Gear	1	2013	
8	Bearing	1		80202
9	Collar	1	2005	
10	Quadrant	1	2016	
11	Shaft	1	2006	
12	Gear	1	2015	
13	Key	1		A5 × 23

GEAR BOX PARTS LIST

Please refer to parts list on page 23 for part numbers.



GEAR BOX PARTS LIST

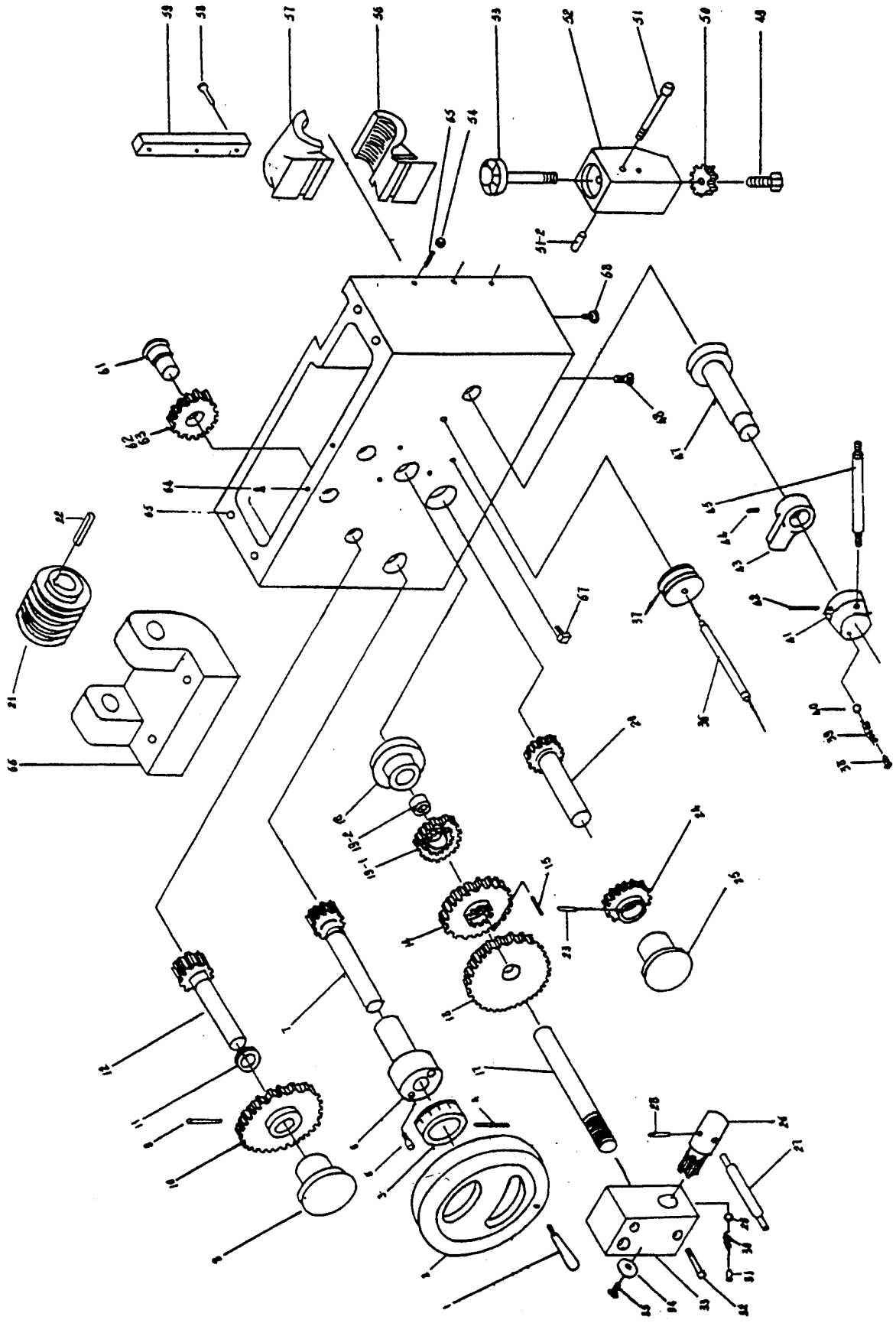
When ordering parts from this list, please mention "Gear Box Part Number", as well as the number.

No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation	No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation
1	Lead Screw	1	7008		38	Pin	1		3×3
2	Pin	2		5×35	39	Pin	1		3×3
4	Bearing	3		8103	40	Gear	1	3021	
5	Shaft	1	3037		41	Gear	1	3022	
6	Key	2		A5×15	42	Gear	2	3020-1	
8	Gear	1	3044-1		44	Gear	1	3029	
9	Nut	4		M12	45	Gear	1	3030	
10	Washer	2	3046		46	Gear	1	3031	
11	Screw	3		M6×16	47	Gear	1	3032	
12	Cover	1	3025		48	Gear	1	3033	
13	Key	1		A5×23	49	Gear	1	3034	
14	Key	1		C5×9	50	Gear	1	3035	
15	Shaft	1	3027		51	Gear	1	3036	
16	Bushing	2	3020-2		52	Gear	1	3040	
18	Gear	1	3026		53	Shaft	1	3028	
20	Gear	1	3020-1		54	Key	1		A5×75
22	Lever	1	1046		55	Key	1	3038	
23	Feed Rod	1	7009		56	Bearing	2		7000102
24	Screw	2		M10×30	57	Gear	2	3016	
25	Boss	1	1047		58	Gear	2	3047	
26	Pin			5×40	59	Shift Lever	2	3003	
27	Gear Box	1	3001		62	Key	2	3018	
	Housing	1			63	Shaft	1	3017	
28	Plate	1	3002		64	Nut	2	3049	
29	Screw	4		M6×16	65	Shaft	2	3048	
30	Shaft	1	3012		66	Shaft	2	3006	
31	Circlip	1		12	67	Spring	2	3005	
32	Shift Pivot	1	3013		68	Sleeve	2	3007	
33	Pin	1		4×30	69	Housing	2	3004	
34	Shift Yoke	1	3014		70	Shaft	1	3041	
35	Screw	1		M6×12	71	Screw	2		M8×8
36	Washer	1	3024		71-1	Pin	1	3015	
37	Gear(sleeve)	1	3023-1		72	Gear	1	3042	
			3023-2		73	Gear	1	3044	
					74	Shaft	1	3045	

Please refer to parts diagram on page 22 for this list.

APRON PARTS DIAGRAM

Please refer to parts list on page 25.



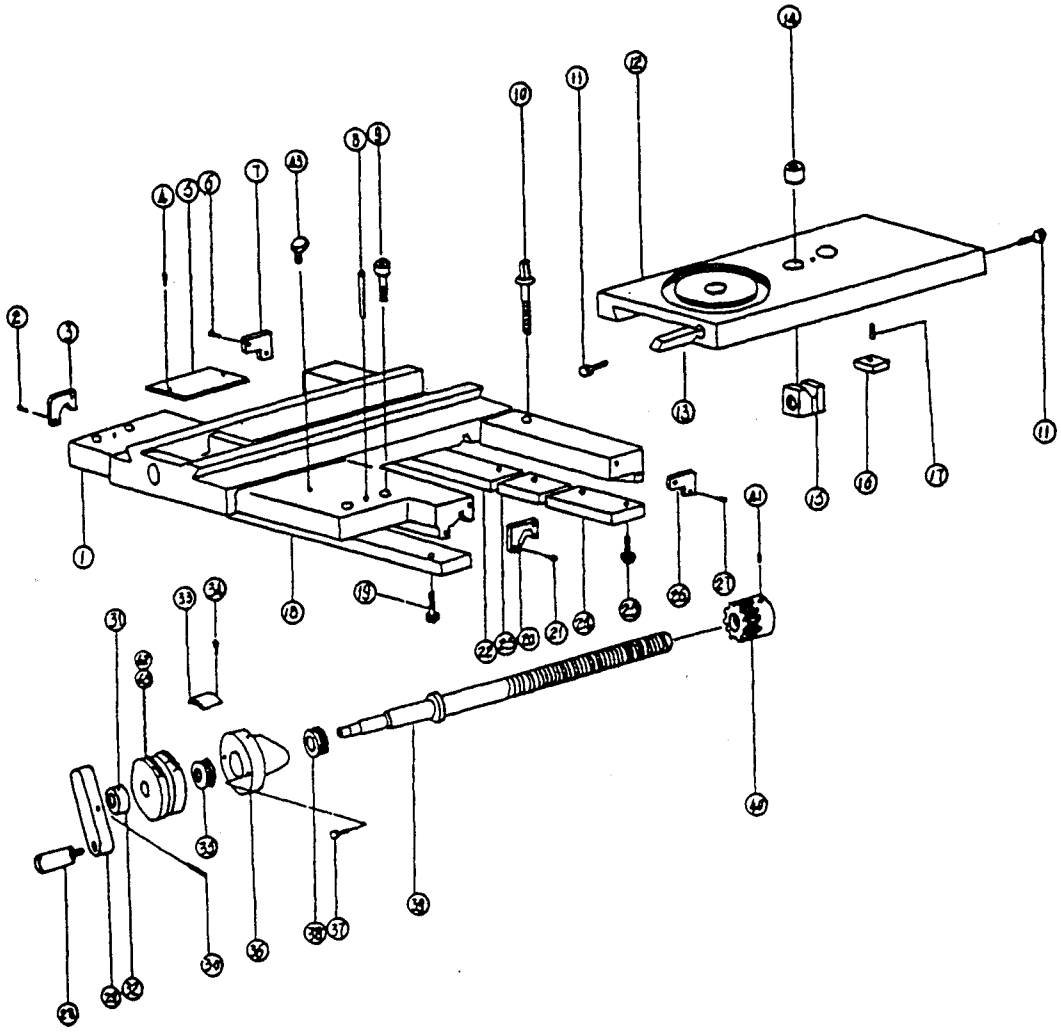
APRON PARTS LIST

When ordering parts from this list, please mention "Apron Part Number", as well as the number.

No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation	No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation
1	Handle	1	4001		35	Screw	1		M6×12
2	Hand Wheel	1	4002		36	Shaft	1	4023	
3	Index Ring	1	4003		37	Safty Shifter	1	4027	
4	Pin	1		5×50	38	Screw	1		M8×8
5	Screw	2		M6×20	39	Spring	1	(4045)	Φ6×1×16
6	Bracket	1	4004		40	Ball	1		Φ6
7	Gear Shaft	1	4006		41	Boss	1	4030	
8	Bushing	1	4007		42	Pin	1		5×40
9	Pin	1		5×30	43	Dog	1	4028	
10	Gear	1	4010		44	Screw	1		M5×8
11	Washer	2	4011		45	Lever	1	4031	
12	Gear Shaft	1	4009		47	Shaft	1	4029	
13	Gear	1	4034		47-1	Pin	1		5×10
14	Gear	1	4033		47-2	Pin	1		4×30
15	Pin	3		5×33	47-3	Screw	2		M5×6
17	Shaft	1	4039		48	Screw	2		M8×35
18	Bushing	1	4017		49	Screw	1		M6×16
18-1	Screw	2		M5×8	50	Gear	1	4022	
19-1	Gear	1	4032		51-1	Screw	1		M6×65
19-2	Sleeve	2	4038		52	Housing	1	4021	
20	Shaft	1	4015		51-2	Sleeve	1	4020	
20-1	Worm Geear	1	4013		53	Thread Dial	1	4019	
20-2	Screw	1		M6×6	54	Nut	3		M6
21	Worm	1	4014		55	Screw	3		M6×12
22	Flat Key	1		5×38	56	Half Nut	1	4024	
23	Pin	1		5×25	57	Half Nut	1	4025	
24	Gear	1	4008			Housing	1		
25	Bushing	1	4016		58	Screw	1		M6×25
26	Gear Shaft	1	4036		59	Gib	1	4026	
27	Lever	1	4037		61	Shaft	1	4042	
28	Pin	1		5×25	62	Gear	1	4044	
29	Ball	1		Φ6	63	Bushing	1	4043	
30	Spring	1	(4045)	Φ6×1×16	64	Screw	1		M6×6
31	Screw	1		M8×12	65	Apron Case	1	4005	
32	Screw	3		M6×45	66	Worm Frame	1	4012	
33	Boss	1	4040		67	Limit Block	1	4035	
34	Washer	1	4041		68	Screw	2	4018	

Please refer to parts diagram on page 24.

SADDLE PARTS DIAGRAM



Please refer to parts list on page 27 for this diagram.

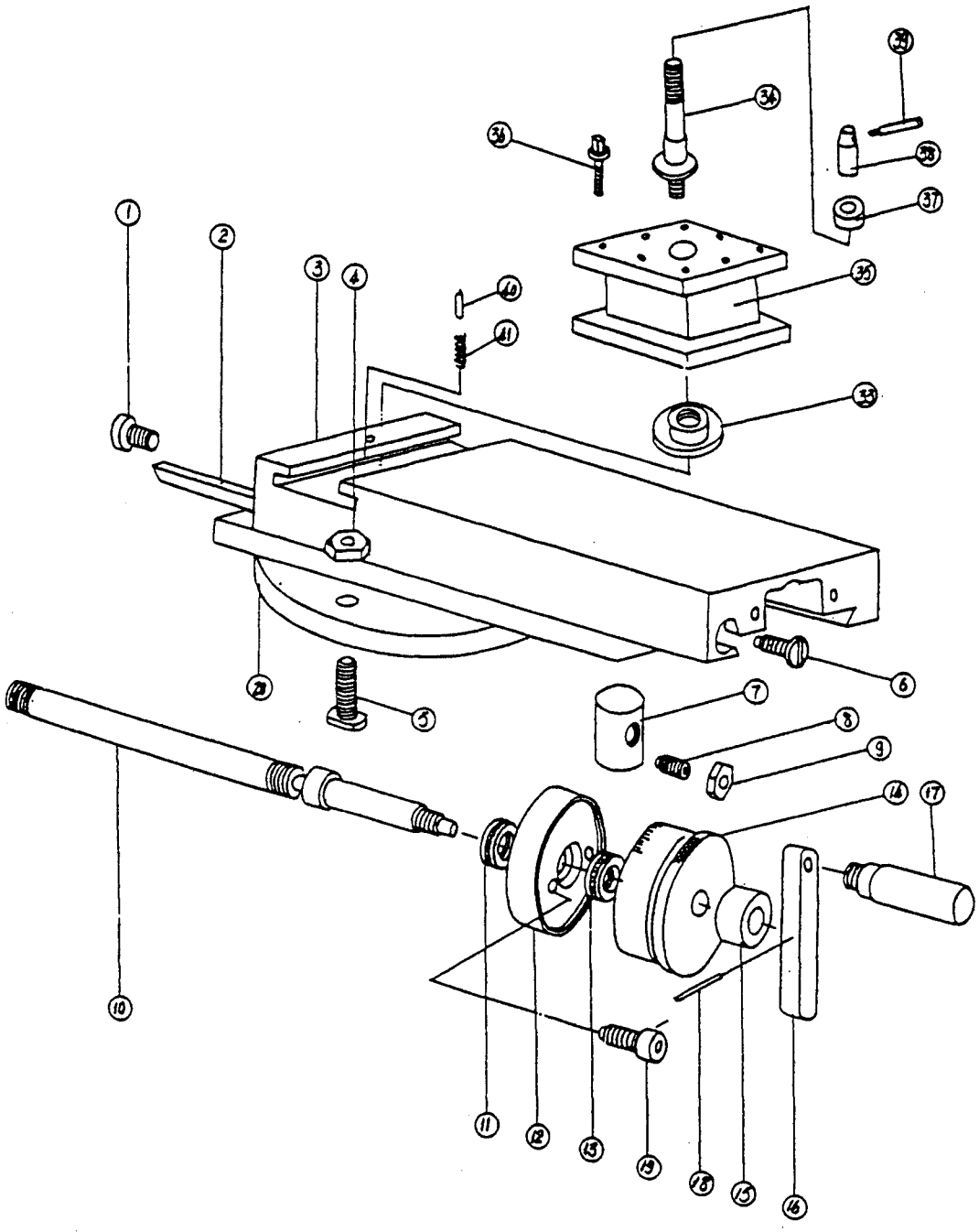
SADDLE PARTS LIST

When ordering parts from this list, please mention "Saddle Part Number", as well as the number.

No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation	No.	DESCRIP-TION	Q'TY	PART NO.	Specific-ation
1	Saddle	1	5005		22	Slide Plate	1	5002	
2	Screw	2		M5×10	23	Slide Plate	1	5003	
3	Wiper	1	5010		24	Slide Plate	1	5004	
4	Screw	2		M5×5	25	Screw	4		M8×25
5	Cover	1	5012		27	Screw	2		M5×10
6	Screw	2		M5×5	28	Handle	1	5020、	
7	Wiper	2	5001					5021、	
8	Pin	2		5×45				5052.5023	
9	Screw	4		M10×30	29	Bracket	1	5019	
10	Screw	1	5050		30	Pin	1		4×20
11	Screw	2	5041		31	Screw	1		M6×6
12	Tool Post	1	5024		31-1	Washer	1	5017	
	Slide				32	Nut	1	5018	
13	Gib	1	5040		33	Signboard	1	5052	
14	Bushing	2	5007		34	Rivet	2		2×6
14-1	Screw	2		M6×16	35	Bearing	1		8102
15	Nut	2	5008		36	Bracket	1	5015	
16	Wedge	1	5009		37	Screw	1		M6×30
	aduster				38	Bearing	2		8102
17	Screw	1		M6×16	39	Screw	1	5006	
18	Slide Plate	1	5011		40	Gear	1	5013	
19	Screw	2		M8×25	41	Screw	1		M6×6
20	Wiper	1	5051		42	Dial	1	5016	
21	Screw	2		M5×10	43	Screw	1	5053	

Please refer to diagram on page 26 for this list.

TOOL POST PARTS DIAGRAM



Please refer to parts list on page 29 for this diagram.

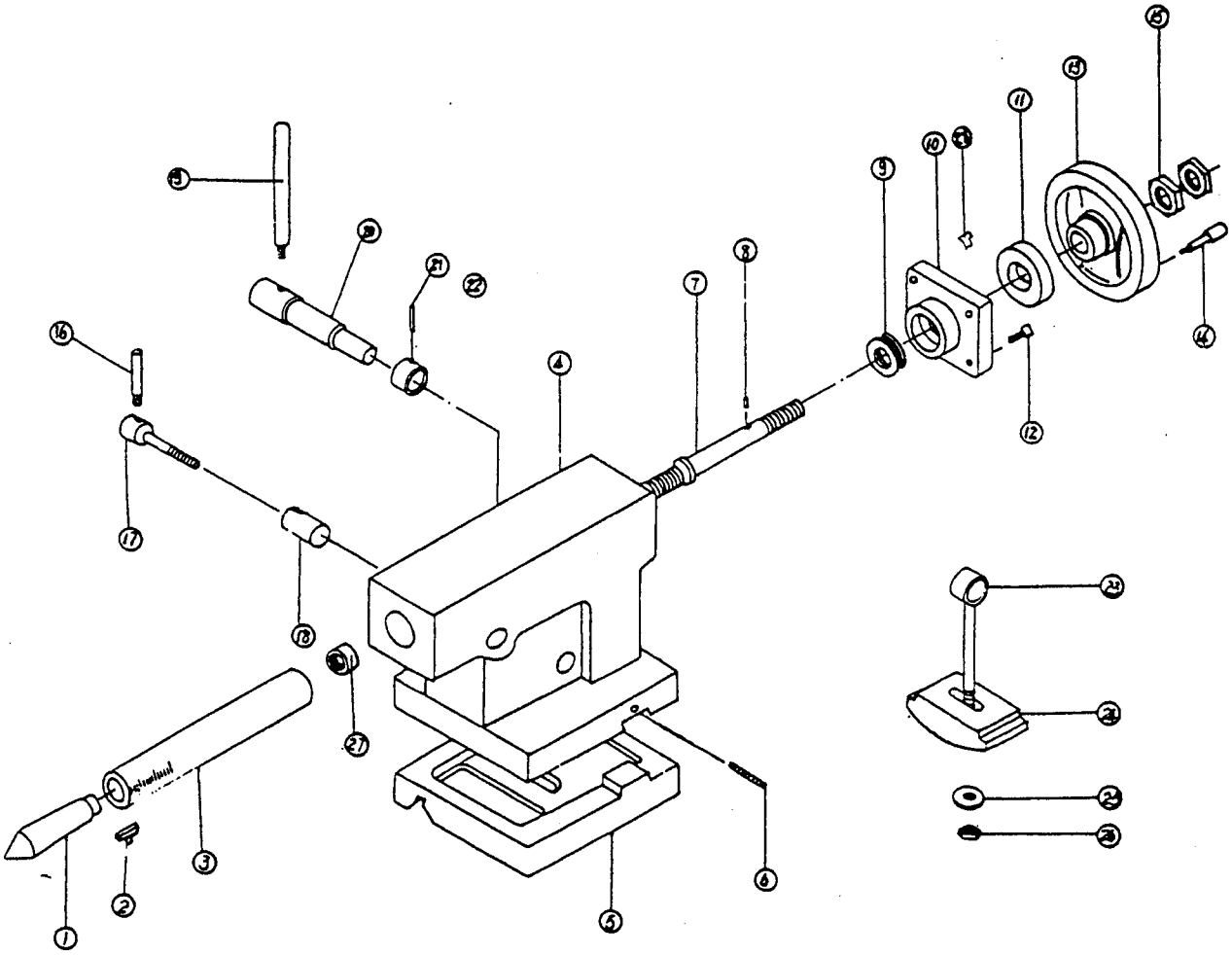
TOOL POST PARTS LIST

When ordering parts from this list, please mention "Tool Post Part Number", as well as the number.

No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Screw	1	5029	
2	Gib	1	5028	
3	Compound Slide	1	5030	
4	Nut	2		M10
5	Screw	2	5025	
6	Screw	1	5029	
7	Nut	1	5042	
8	Screw	1		M6 × 12
9	Nut	1		M6
10	Screw	1	5043	
11	Bearing	1		8101
12	Bracket	1	5044	
13	Bearing	1		8101
14	Index Ring	1	5045	
15	Nut	1	5046	
16	Bracket	1	5047	
17	Handle	1	5048、5049	
18	Pin	1		3 × 16
19	Screw	1		M6 × 25
20	Compound Rest	1	5026	
33	Nut	1	5031	
34	Shaft	1	5032	
35	Tool Post	1	5033	
36	Screw	8	5034	
37	Collar	1	5035	
38	Boss	1	5036	
39	Handle	1	5037	
40	Pin	1	5038	
41	Spring	1	5039	

Please refer to diagram on page 28 for this list.

TAIL STOCK PARTS DIAGRAM



Please refer to parts list on page 31 for this diagram.

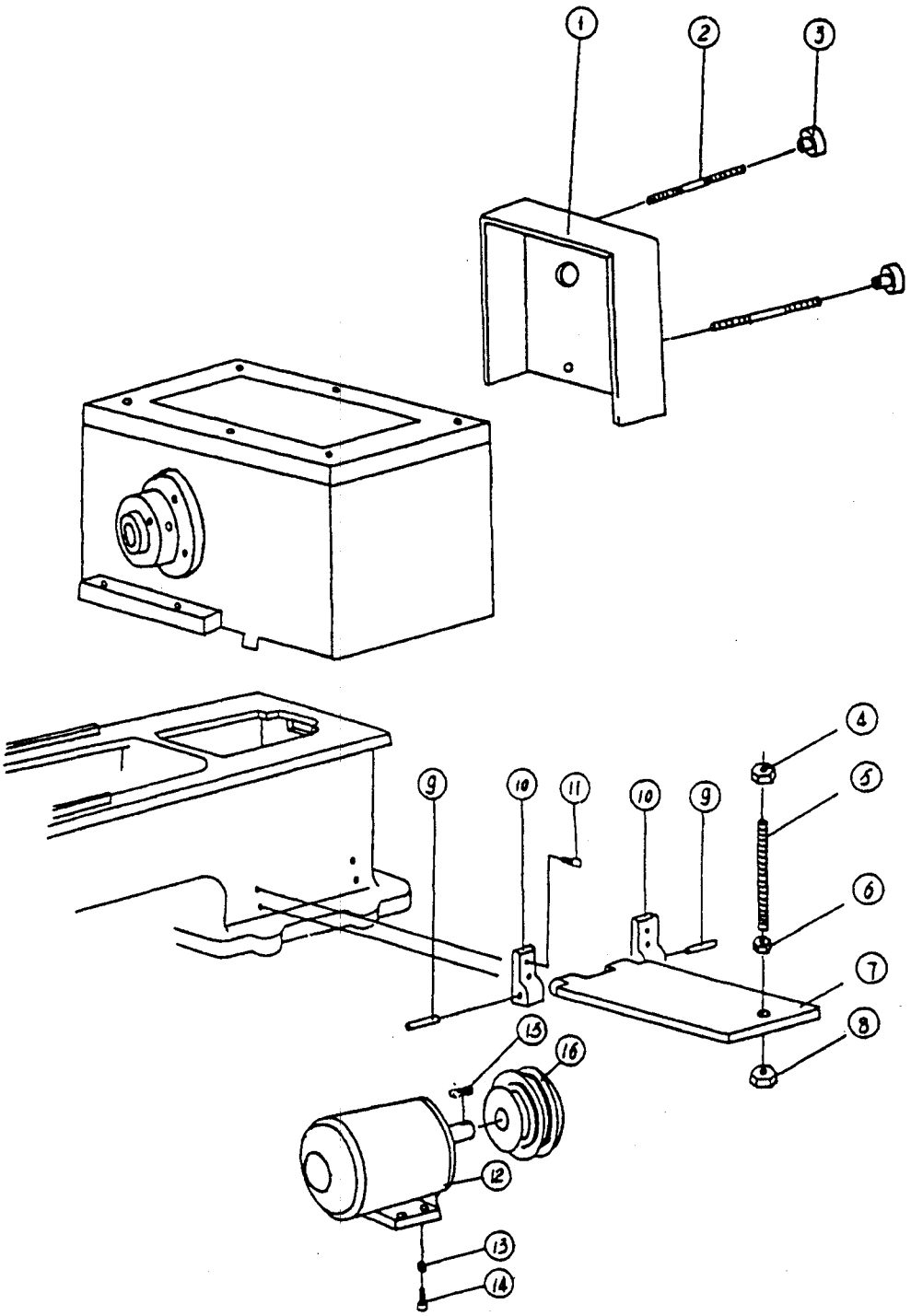
TAIL STOCK PARTS LIST

When ordering parts from this list, please mention "Tailstock Part Number", as well as the number.

No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Center	1	8019	
2	Key	1	8012	
3	Quill	1	8010	
4	Tail Stock	1	8001	
5	Base	1	8002	
6	Screw	2	8018	
7	Screw	1	8009	
8	Pin	1		4 × 8
9	Bearing	1		8101
10	Bracket	1	8006	
11	Index Ring	1	8007	
12	Screw	4		M6 × 20
13	Hand Wheel	1	8005	
14	Handle	1	5020	
			5021	
			5022	
15	Nut	2		M10
16	Handle	1	8014	
17	Lock Screw	1	8013	
18	Lock Shaft	1	8011	
19	Handle	1	8004	
20	Shaft	1	8017	
21	Pin	1		5 × 30
22	Collar	1	8016	
23	Shaft	1	8015	
24	Bass Shoe Block	1	8020	
25	Washer	1	8022	12
26	Nut	1		M12
27	Nut	1	8008	
28	Index Piece	1	8021	

Please refer to parts diagram on page 30 for this list.

BED AND DRIVE ASSEMBLY PARTS DIAGRAM



Please refer to parts list on page 33 for this diagram.

BED AND DRIVE ASSEMBLY

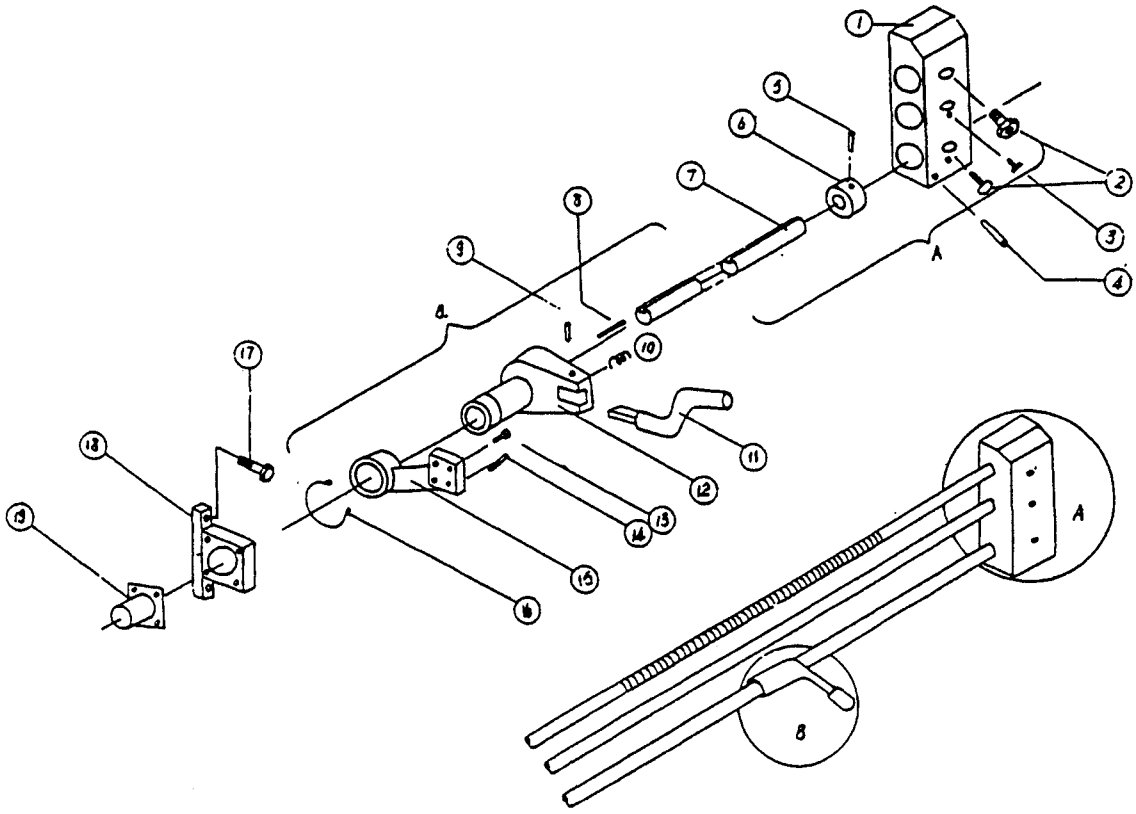
When ordering parts from this list, please mention "Bed and Drive Assembly Part Number", as well as the number.

No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Cover	1	2003	
2	Screw	2	2002	
3	Nut	2	2001	
4	Nut	1		M10
5	Screw	1	7013	
6	Nut	2		M12
7	Plate	1	7018	
8	Washer	2		12
9	Shaft	2	7017	
10	Bracket	2	7016	
11	Screw	4		M8 × 25
12	Motor	1		1.1KW
13	Nut	4		M10
13-1	Washer	1		10
14	Screw	4		M10 × 40
15	Key	1		8 × 40
16	Pulley	1	7001	

Please refer to parts diagram on page 32 for this list.

CONTROL SWITCH ASSEMBLY

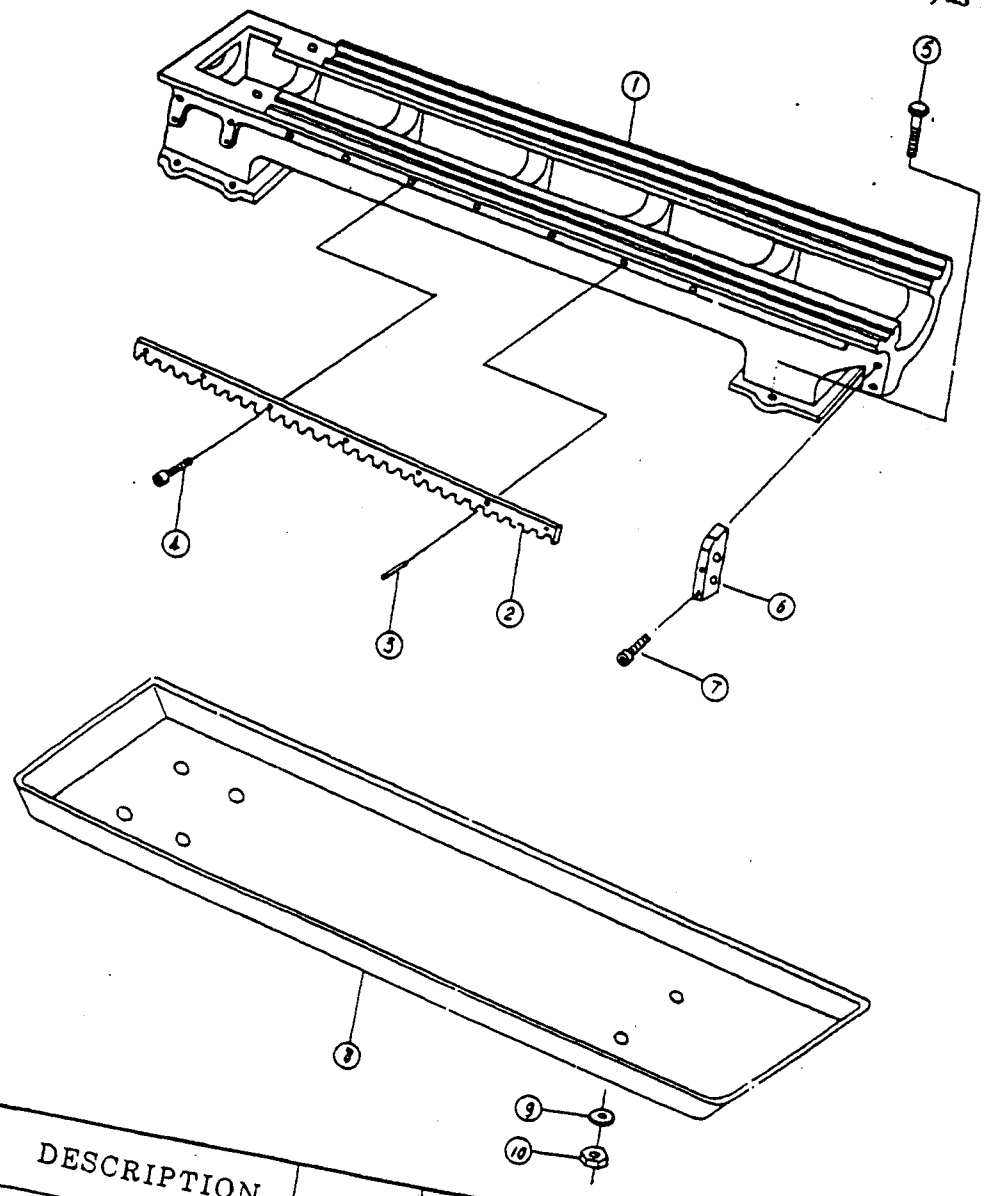
When ordering parts from this list, please mention "Control Switch Part Number", as well as the number.



No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Bracket	1	7011	
2	Screw	2		M10 × 60
3	Oil Cup	2		Φ 6
4	Pin	2		6 × 55
5	Pin	1		4 × 30
6	Collar	1	7026	
7	Rod	1	7010	
8	Key	1		5 × 38
9	Pin	1		4 × 20
10	Spring	1	7020	
11	Handle	1	7015	
12	Bracket	1	7019	
13	Screw	2		M6 × 20
14	Pin	2		5 × 20
15	Bracket	1	7014	
16	Circlip	1		32
17	Screw	1		M8 × 25
18	Bracket	1	7021	
19	Switch	1		Hz5B – 10/2D009

When ordering parts from this list, please mention "Bed Assembly Part Number", as

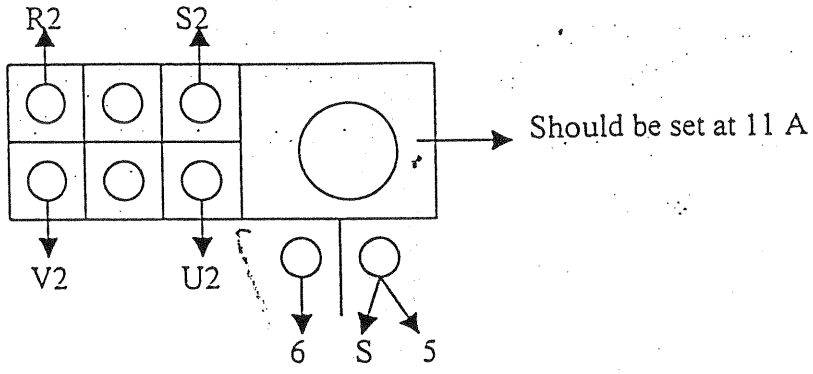
BED ASSEMBLY



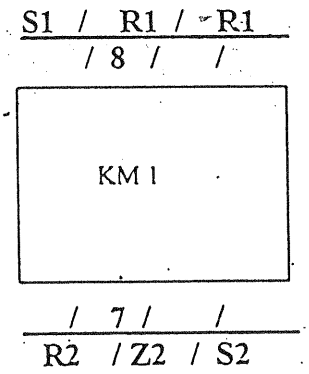
No.	DESCRIPTION	Q'TY	PART No.	Specification
1	Lathe Bed	1	7004	
2	Rack Gear	1	7005、7007	
3	Pin	6		
4	Screw	6		
5	Screw	6		5 × 18
6	Bracket	1		M6 × 16
7	Screw	2	7011	M10 × 35
8	Chip Pan	1		
9	Washer	6	7023	M10 × 60
10	Nut	6		10

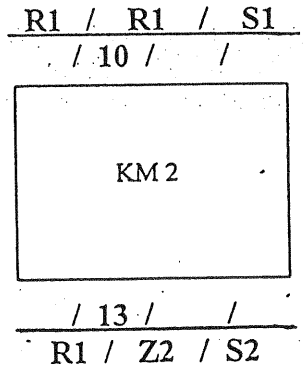
LATHE – 12" x 36" METAL
SKU 33274
WIRING DIAGRAM
220V - SP

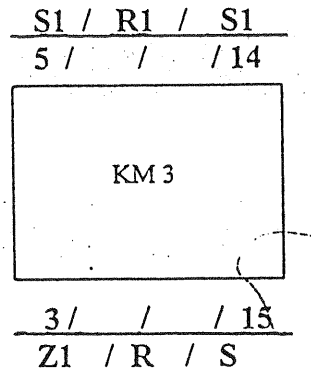
Heater Relay



AC Contacters

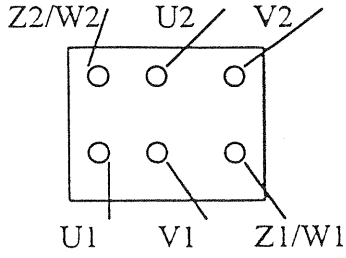




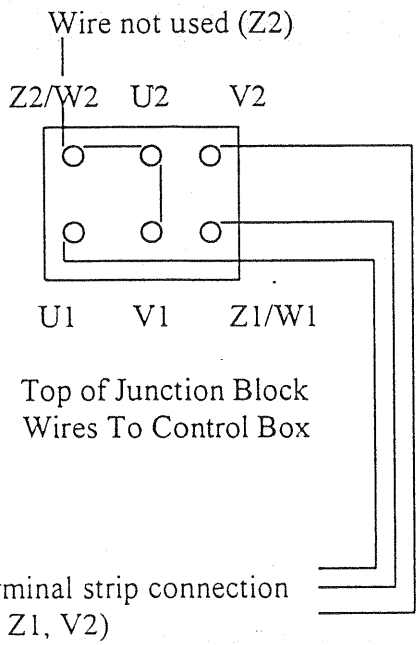


LATHE – 12" x 36" METAL
SKU 33274
WIRING DIAGRAM
220V - SP

MOTOR CONNECTIONS



Back of Junction Block
Wires From Motor

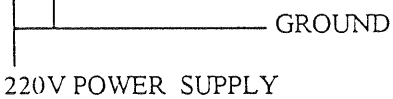


Top of Junction Block
Wires To Control Box

TERMINAL CONNECTIONS

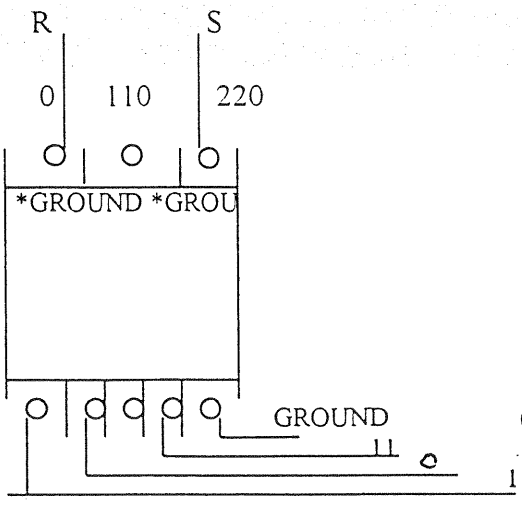
R - S - Z2 - Z1 - V2 - U1 – [7 - 7 - 13 - 5 - 5 - 4 - 4 - 3 - 2 - 14 - 15 – 0]

0 0 * * * - CONTROL WIRING ONLY- *

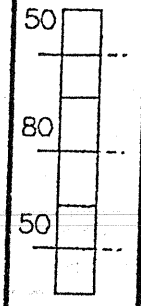


220V POWER SUPPLY

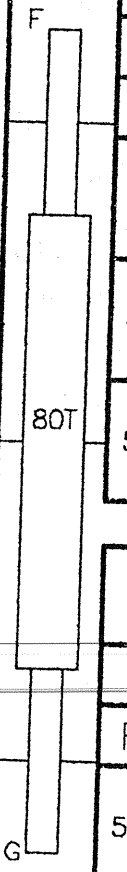
TRANSFORMER CONNECTIONS-22V



(Wires: 1, 11, are terminated at respective fast blow fuses.
Wire 0 terminated at respective terminal strip connection. *)



	1	2	3	4	5	6	7	8
FEEDING ~~~ INCH/?								
G	0.0078	0.0069	0.0066	0.0062	0.0057	0.0052	0.0048	0.0044
E	0.0311	0.0277	0.0262	0.0249	0.0226	0.0207	0.0191	0.0178
FEEDING ~~~ mm/?								
G	0.198	0.175	0.167	0.158	0.144	0.132	0.122	0.113
E	0.791	0.703	0.666	0.632	0.575	0.527	0.486	0.452



CHANGE GEAR CHART FOR mm SIZE

COMBINATIONS OF GEARS F		G	position	mm PER PITCH 1	2	3	4	5	6	7	8
25	ANY	71	D	2.25	2		1.75		1.5	1.375	1.25
			F	0.55	0.5		0.45	0.4		0.35	
49	ANY	71	D				3.5				2.5
			F					0.8			
50	ANY	71	D	4.5	4	3.75		3.25	3	2.75	
			F		1		0.9				

CHANGE GEAR CHART FOR INCH SIZE

COMBINATIONS OF GEARS F		G	position	T.P.I 1	2	3	4	5	6	7	8
50	ANY	50	D	4	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7
			F	16	18	19	20	22	24	26	28
25	ANY	50	D	8	9	$9\frac{1}{2}$	10	11	12	13	14
			F	32	36	38	40	44	48	52	56